

**A DISSERTATION ON
FOLLOW UP OF TREATED CASES OF
APPENDICULAR MASS AND ABSCESS AND
ASCERTAINING THE ROLE OF INTERVAL
APPENDICECTOMY**

Dissertation submitted to

**THE TAMIL NADU DR.M.G.R.MEDICAL UNIVERISTY
CHENNAI**

*With partial fulfillment of the regulations
For the Award of the degree*

**M.S. (GENERAL SURGERY)
BRANCH – I**



**MADRAS MEDICAL COLLEGE,
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APRIL-2017

BONAFIDE CERTIFICATE

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ACKNOWLEDGEMENT

I would like to express my deep sense of gratitude to the **DEAN**, Madras Medical College and **Prof.Dr.K.RAMASUBRAMANIAN M.S**, Director, Institute of General Surgery , MMC & RGGGH, for allowing me to undertake this study on “**FOLLOW UP OF TREATED CASES OF APPENDICULAR MASS AND ABSCESS AND ASCERTAINING THE ROLE OF INTERVAL APPENDICECTOMY**”

I was able to carry out my study to my fullest satisfaction, thanks to guidance, encouragement, motivation and constant supervision extended to me, by my beloved Unit Chief **Prof. Dr. G.MUTHUKUMARAN M.S**. Hence my profuse thanks are due for him.

I am bound by ties of gratitude to my respected Assistant Professors, **Dr.Krishnamoorthy M.S., Dr.Kalyan Kumar M.S., and Dr. Sivan M.S.**, in general, for placing and guiding me on the right track from the very beginning of my career in Surgery till this day. I would be failing in my duty if I don't place on record my sincere thanks to those patients who inspite of their sufferings extended their fullest co-operation.

I am fortunate to have my postgraduate colleagues, for their invaluable suggestions, relentless help for shouldering my responsibilities. Simply words cannot express its depth for their unseen contributions. Lastly, my lovable thanks to my parents for their moral support.

DECLARATION

I , certainly declare that this dissertation titled, **“FOLLOW UP OF TREATED CASES OF APPENDICULAR MASS AND ABSCESS AND ASCERTAINING THE ROLE OF INTERVAL APPENDICECTOMY”** represent a genuine work of mine . The contribution of any supervisors to the research are consistent with normal supervisory practice, and are acknowledged.

I, also affirm that this bonafide work or part of this work was not submitted by me or any others for any award, degree or diploma to any other university board, neither in India or abroad. This is submitted to The Tamil Nadu Dr.MGR Medical University, Chennai in partial fulfillment of the rules and regulation for the award of Master of Surgery Degree Branch-I (General Surgery).

Dr.DANIEL RAVIKUMAR R

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ABSTRACT

BACKGROUND

An appendicular mass is one of the common complications seen in patients presenting a few days later after the onset of acute appendicitis. There is no consensus on the optimum treatment of this potentially dangerous condition. - The purpose of this dissertation is to analyse the follow up cases of treated cases of appendicular mass and abscess and ascertaining the role of interval appendicectomy, to analyse and compare the clinical response of appendicular mass and abscess treated conservatively and surgically(drainage),to assess the role of interval appendicectomy and its benefit during the follow up of these cases.

METHODS

A proforma for study of all consecutive patients of APPENDICULAR MASS AND ABSCESS will be used. The presentation, clinical findings and the management will be documented.

RESULT AND CONCLUSION

The practice of doing routine interval appendicectomy in a conservatively managed complicated appendicitis in a asymptomatic case during follow up is questionable due to following factors

- ❖ High conversion rate
- ❖ High complication rate
- ❖ Long hospital stay
- ❖ Low recurrence rate
- ❖ Non significant histopathology in some cases

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ANNEXURES

DATA COLLECTION SHEET

I.Patient particulars:

Name	DOA	Case No.
Age	DOS	I.p.No.
Sex	DOD	Address

Occupation:

II.Diagnosis

III.Chief complaints (with duration)

A. Abdominal pain

B. fever

C.Other complaints

PAST HISTORY:

HISTORY OF PREVIOUS OPERATION -

DURATION OF DIABETES -

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3.COMPLICATIONS

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II.ONLY FOLLOW UP :

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**INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI 600 003**

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CERTIFICATE OF APPROVAL

To
Dr.R.Daniel Ravikumar
Post Graduate in M.S. (General Surgery)
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Dear Dr.R.Daniel Ravikumar,

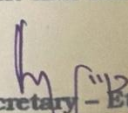
The Institutional Ethics Committee has considered your request and approved your study titled **"FOLLOW UP OF TREATED CASES OF APPENDICULAR MASS AND ABSCESS AND EVALUATING THE NEED OF INTERVAL APPENDICECTOMY "** - **NO.24032016.**

The following members of Ethics Committee were present in the meeting hold on **01.03.2016** conducted at Madras Medical College, Chennai 3

- | | |
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| 1.Dr.C.Rajendran, MD., | :Chairperson |
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We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.


Member Secretary - Ethics Committee
MEMBER SECRETARY
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INTRODUCTION

An appendicular mass is one of the common complications seen in patients presenting a few days later after the onset of acute appendicitis. There is no consensus on the optimum treatment of this potentially dangerous condition.

The ideal treatment of acute appendicitis is considered to be appendectomy failing which a number of complications, including an appendicular mass, usually result (Margaret Farquharson and Brendan Moran 2007). This usually follows a late presentation or a failure of diagnosis at presentation. Sadly, when the diagnosis has been missed at first presentation to a physician the history is often found to have been quite unremarkable and the error considered avoidable.

Traditionally acute appendicitis was principally diagnosed on repeated physical examinations after active observation, without much reliance on laboratory investigations. Greater reliance on putatively objective tools for the diagnosis can delay the diagnosis and has changed the outlook for some patients (Muhammad Shoiab et al 2010). Delayed diagnosis changes the uncomplicated simple acute appendicitis into complicated appendicitis (Chan L et al 2011). Reluctance for surgery is common in third world where most of the population lives below the poverty line and a single member may generate the income for the whole family. For this reason time off work can be difficult for some. Another

important factor is a general fear of surgery amongst much of the population. Additional factors that contribute to the development of an appendicular mass include lack of health facilities in remote under resourced areas. In some rural areas general practitioners often keep the patient on symptomatic therapy rather than referring to a higher level hospital.

The appendicular mass is reported to be more common among males who are elderly (Okafor et al 2003) and have different pathogenesis, clinical course and outcome (Gurleyik G and Gurleyik E2003). The mass usually forms in the right iliac fossa after 48-72 hours after the first symptoms of acute appendicitis. The mass develops when appendicitis is caused by obstruction of the lumen and there is an ensuing danger of perforation of the appendix following ischemic necrosis and gangrene of the appendicular wall (Norman S William, Christopher JK Bulstrode and P Ronan O' Connel 2008). As a natural protective mechanism, the omentum and small bowel wrap up the inflamed appendix in an attempt to prevent infection from spreading by isolating the inflamed organ from rest of the abdominal cavity. There may have been an evolutionary advantage that selected this kind of defensive mechanism.

The patient usually presents with a tender mass in the right iliac fossa associated with fever, malaise and anorexia. This walling off mechanism may fail and generalized peritonitis may ensue. This is more often seen when there is obstruction of the appendicular lumen by a

faecolith, an immunocompromised patient, the extremes of age, diabetes Mellitus and when the inflamed appendix is lying freely in the pelvis beyond the ability of the omentum to wrap the inflamed organ (Norman S. Williams et al)

OBJECTIVES

- ❖ Appendicitis remains one of the most common diseases faced by the surgeon in practice. It is the most common urgent or emergent general surgical operation performed
- ❖ The purpose of this dissertation is to analyse the follow up cases of treated cases of appendicular mass and abscess and ascertaining the role of interval appendicectomy.
- ❖ To analyse and compare the clinical response of appendicular mass and abscess treated conservatively and surgically(drainage)
- ❖ To assess the role of interval appendicectomy and its benefit during the follow up of these cases

REVIEW OF LITERATURE

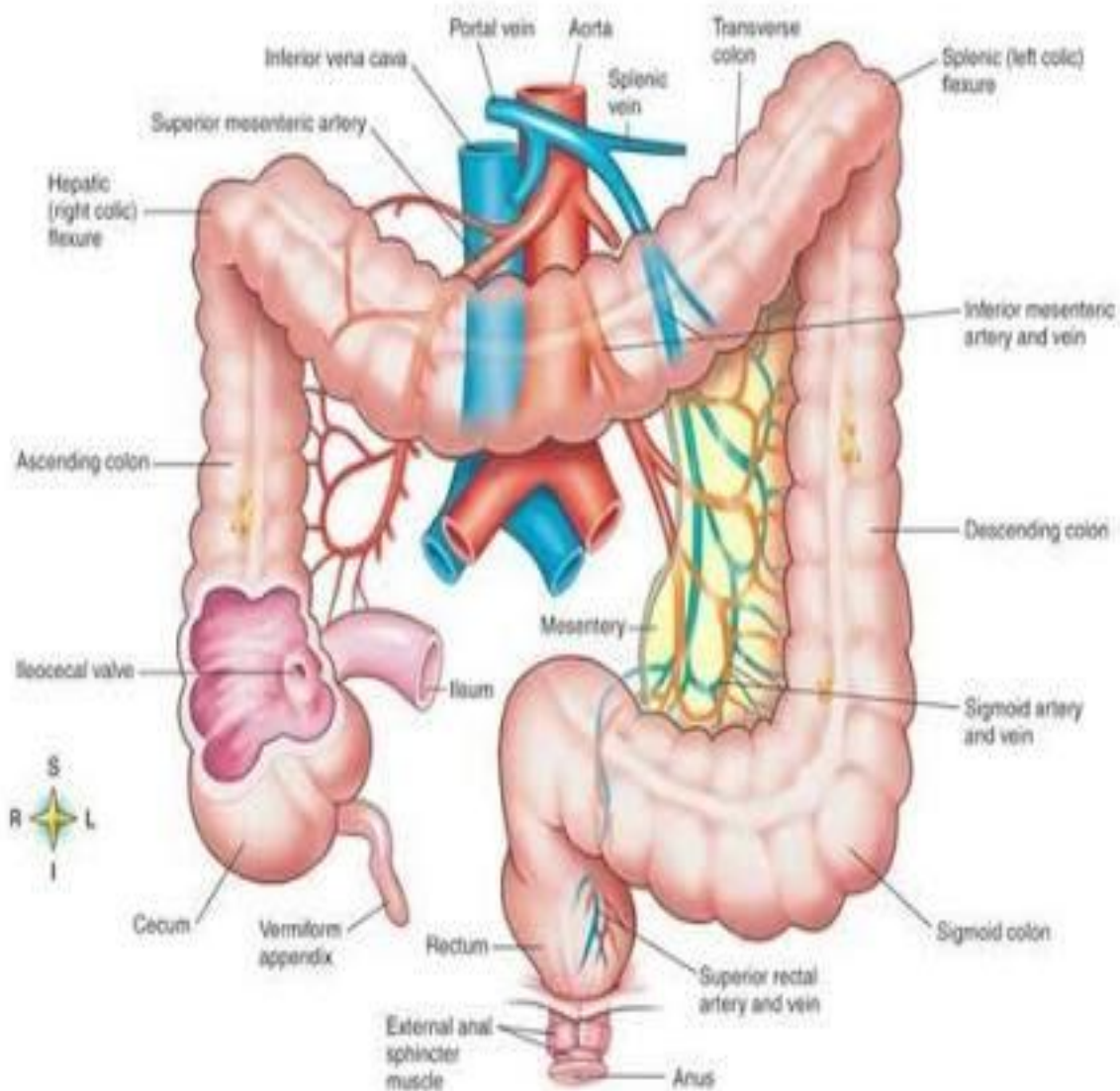
Appendicitis remains one of the most common diseases faced by the surgeon in practice. It is the most common urgent or emergent general surgical operation performed in the United States and is responsible for as many as 300,000 hospitalizations annually.(William et al,2003)

Although appendectomy is often the first “major” case performed by the young surgeon in training, few other operations will be learned that will have such a dramatic impact on the patient being treated. It is estimated that as much as 6% to 7% of the general population will develop appendicitis during their lifetime, with the incidence peaking in the second decade of life. Despite its high prevalence in Western countries, the diagnosis of acute appendicitis can be challenging and requires a high index of suspicion on the part of the examining surgeon to facilitate prompt treatment of this condition, thereby avoiding the substantial morbidity (and even mortality) associated with perforation. Appendicitis is much less common in underdeveloped countries, suggesting that elements of the Western diet, specifically a low-fiber, high-fat intake, may play a role in the development of the disease process.

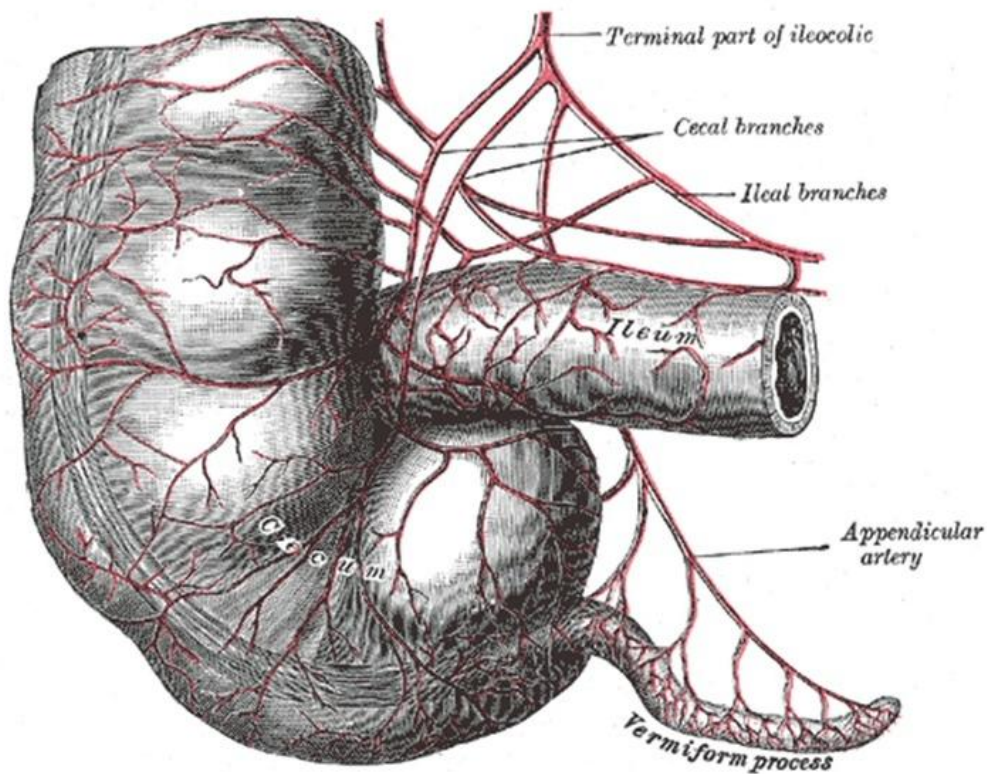
ANATOMY AND EMBRYOLOGY

The appendix is a mid gut organ and is first identified at 8 weeks of gestation as a small out pouching of the cecum. As gestation progresses, the appendix becomes more elongated and tubular as the cecum rotates medially and becomes fixed in the right lower quadrant of the abdomen.

The appendiceal mucosa is of the colonic type, with columnar epithelium, neuro endocrine cells, and mucin -producing goblet cells lining its tubular structure. Lymphoid tissue is found in the submucosa of the appendix, leading some to hypothesize that the appendix may play a role in the immune system. In addition, evidence suggests that the appendix may serve as a reservoir of “good” intestinal bacteria and may aid in re colonization and maintenance of the normal colonic flora. Consensus about this has not been achieved, however. Successful removal of the appendix has not been definitively demonstrated to have any known adverse sequelae.(Caruso et al/2014)



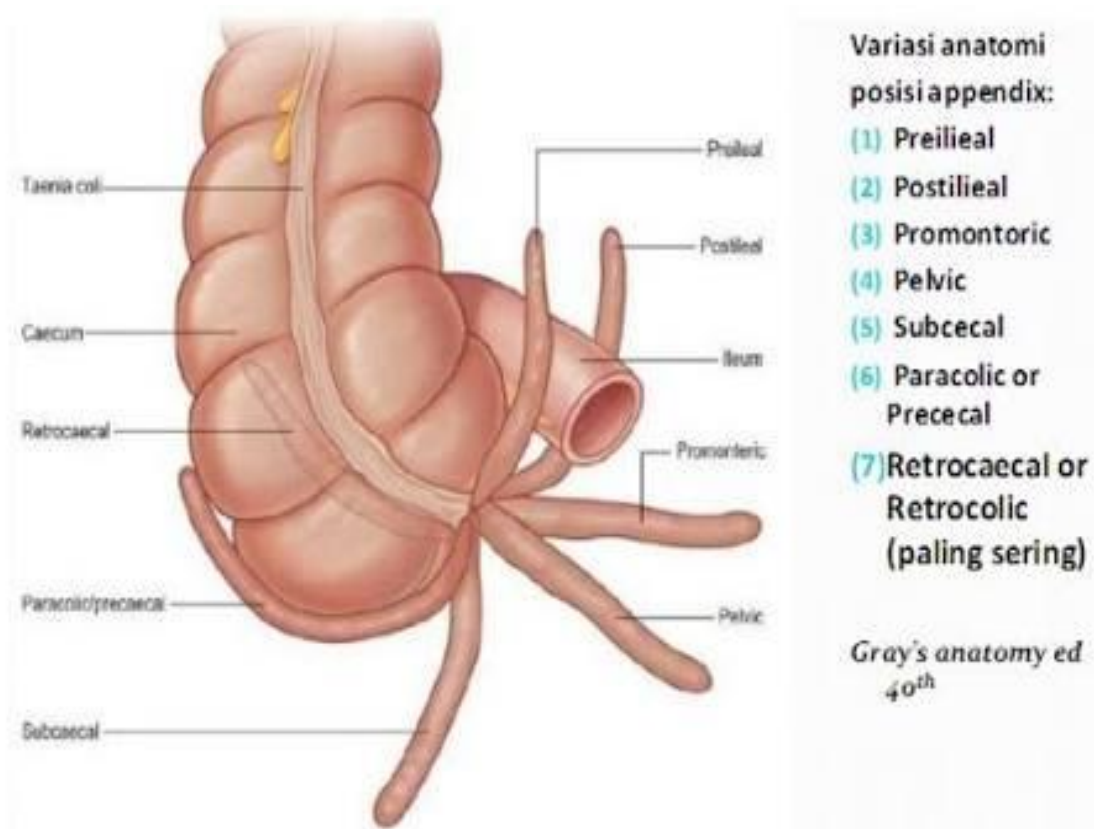
As a midgut organ, the blood supply of the appendix is derived from the superior mesenteric artery. The ileocolic artery, one of the major named branches of the superior mesenteric artery, gives rise to the appendiceal artery, which courses through the *mesoappendix*. The mesoappendix also contains lymphatics of the appendix, which drain to the ileocecal nodes, along the blood supply from the superior mesenteric artery.

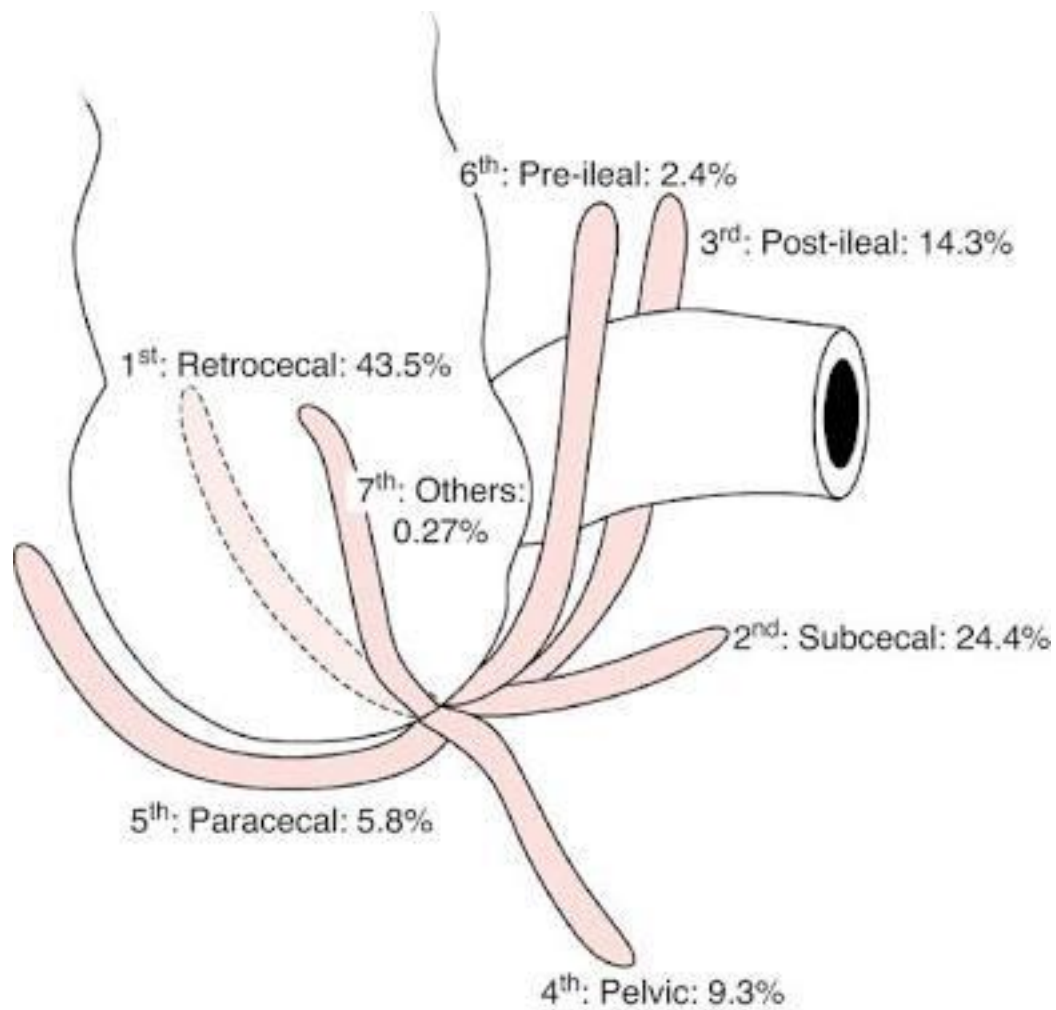


The appendix is of variable size (5 to 35 cm in length) but averages 9 cm in length in adults. Its base can be reliably identified by defining the area of convergence of the taeniae at the tip of the cecum and then elevating the appendiceal base to define the course and position of the tip of the appendix, which is variable in location.

The appendiceal tip may be found in a variety of locations, with the most common being retrocecal (but intraperitoneal) in approximately 60% of individuals, pelvic in 30%, and retroperitoneal in 7% to 10%. Agensis of the appendix has been reported, as has duplication and even triplication. Knowledge of these anatomic variations is important to the

surgeon because the variable position of the appendiceal tip may account for differences in clinical presentation and in the location of the associated abdominal discomfort. For example, patients with a retroperitoneal appendix may present with back or flank pain, just as patients with the appendiceal tip in the midline pelvis may present with suprapubic pain. Both of these presentations may result in a delayed diagnosis as the symptoms are distinctly different from the classically described anterior right lower quadrant abdominal pain associated with appendiceal disease.





HISTORY

The first appendectomy was reported in 1735 by a French Surgeon, Claudius Amyand, who identified and successfully removed the appendix of an 11-year-old boy that was found within an inguinal hernia sac and that had been perforated by a pin. Although autopsy findings consistent with perforated appendicitis appeared sporadically thereafter in the literature, the first formal description of the disease process, including the common clinical features and a recommendation for prompt surgical removal, was in 1886 by Reginald Heber Fitz of Harvard University.

Notable advances in surgery for appendicitis include McBurney's description of his classic muscle-splitting incision and technique for removal of the appendix in 1894 and the description of the first laparoscopic appendectomy by Kurt Semm in 1982. Laparoscopic appendectomy has become the preferred method for management of acute appendicitis among surgeons in the United States and may be accomplished using several (typically three) trocar sites or through single-incision laparoscopic surgical techniques.(norman et al 2008)

Finally, but of no less significance, was the development of broad-spectrum antibiotics, interventional radiologic techniques, and better surgical critical care strategies, all of which have resulted in substantial improvements in the care of patients with appendiceal perforation and its subsequent complications.

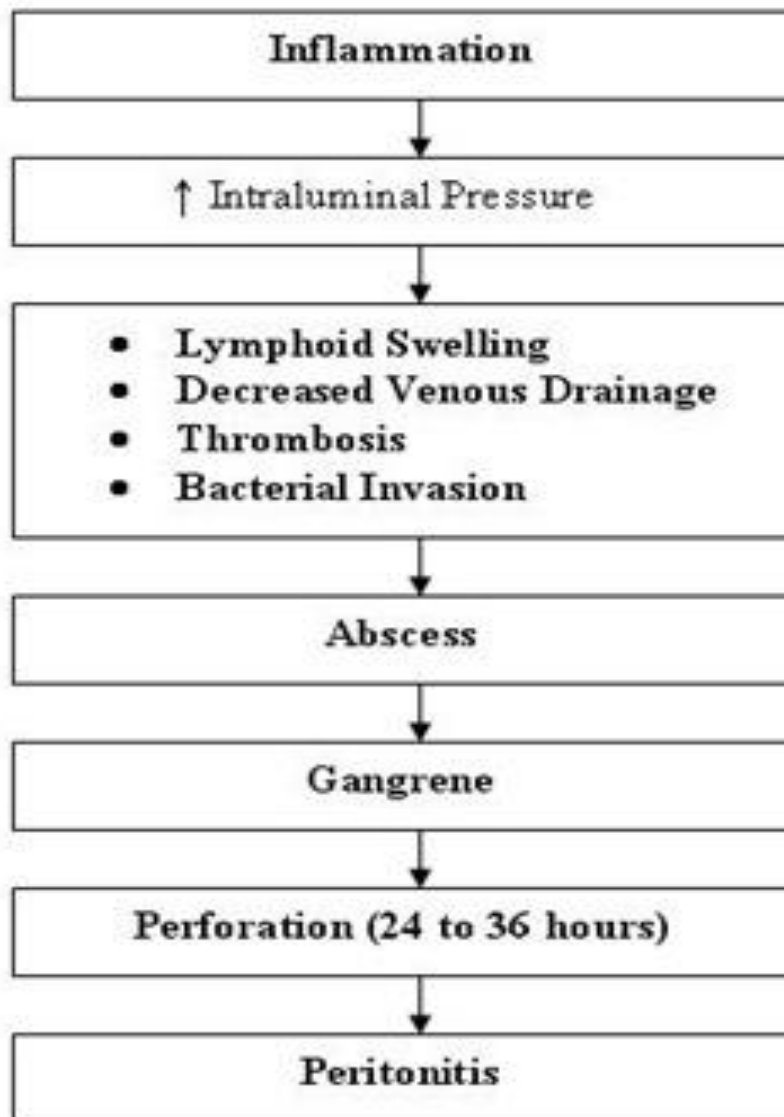
PATHOPHYSIOLOGY AND BACTERIOLOGY

Appendicitis is caused by luminal obstruction. The appendix is vulnerable to this phenomenon because of its small luminal diameter in relation to its length. Obstruction of the proximal lumen of the appendix leads to elevated pressure in the distal portion because of ongoing mucus secretion and production of gas by bacteria within the lumen.

With progressive distention of the appendix, the venous drainage becomes impaired, resulting in mucosal ischemia. With continued obstruction, full-thickness ischemia ensues, which ultimately leads to perforation. Bacterial overgrowth within the appendix results from bacterial stasis distal to the obstruction. This is significant because this overgrowth results in the release of a larger bacterial inoculum in cases of perforated appendicitis.(Dixon et al,2009)

The time from onset of obstruction to perforation is variable and may range anywhere from a few hours to a few days. The presentation after perforation is also variable.

The most common sequelae is the formation of an abscess in the peri appendiceal region or pelvis. On occasion, however, free perforation occurs that results in diffuse peritonitis. Because the appendix is an out pouching of the cecum, the flora within the appendix is similar to that found within the colon.



Infections associated with appendicitis should be considered polymicrobial, and antibiotic coverage should include agents that address the presence of both gram-negative bacteria and anaerobes. Common isolates include *Escherichia coli*, *Bacteroides fragilis*, enterococci, *Pseudomonas aeruginosa*, and others.

The causes of the luminal obstruction are many and varied. These most commonly include fecal stasis and fecoliths but may also include

lymphoid hyperplasia, neoplasms, fruit and vegetable material, ingested barium, and parasites such as ascaris.

Pain of appendicitis has both visceral and somatic components. Distention of the appendix is responsible for the initial vague abdominal pain (visceral) often experienced by the affected patient. The pain typically does not localize to the right lower quadrant until the tip becomes inflamed and irritates the adjacent parietal peritoneum (somatic) or perforation occurs, resulting in localized peritonitis. (brown et al,2009)

Most commonly isolated bacteria in case of appendiceal perforation are

- ❖ Anaerobic
- ❖ *Bacteroides fragilis*
- ❖ *Bacteroides thetaiotaomicron*
- ❖ *Bilophila wadsworthia*
- ❖ *Peptostreptococcus* spp.
- ❖ Aerobic
- ❖ *Escherichia coli*
- ❖ *Viridans streptococcus*
- ❖ Group D streptococcus
- ❖ *Pseudomonas aeruginosa*

PATHOGENESIS OF THE APPENDICULAR MASS

The appendicular mass usually develops following an attack of acute appendicitis and ranges from a phlegmon to an abscess formation and is usually palpable as a tender mass in the right iliac fossa (Brown CV et al 2003). As described above it usually develops in patients presenting later in the course of acute appendicitis where there is a natural walling off of the inflamed appendix by omentum and coils of small bowel in the vicinity of appendix. Initially this mass is composed of a confused mixture of inflamed appendix these organs and granulation tissue (Brian W.Ellis and Simon –Paterson-Brown 2000). If the barriers work and the inflamed appendix does not perforate a clinically palpable tender mass develops in the right iliac fossa within 48 hours. If the barriers cannot wall off the inflammation or the appendix perforates an appendicular abscess may develop. Another term for the mass is phlegmon. The mass poses a dilemma to the surgeon as to the optimum treatment since there are more than one school of thought and different modes of treatment are suggested.(david et al,1998)

HISTORY

Appendicitis needs to be considered in the differential diagnosis of almost every patient with acute abdominal pain. Early diagnosis remains the most important clinical goal in patients with suspected appendicitis

and can be made primarily on the basis of the history and physical examination in most cases.

The typical presentation begins with peri umbilical pain, caused by the activation of visceral afferent neurons, followed by anorexia and nausea. The pain then localizes to the right lower quadrant as the inflammatory process progresses to involve the parietal peritoneum overlying the appendix. This classic pattern of migratory pain is the most reliable symptom of acute appendicitis.

A bout of vomiting may occur, in contrast to the repeated bouts of vomiting that typically accompany viral gastroenteritis or small bowel obstruction. Fever ensues, followed by the development of leukocytosis. These clinical features may vary. For example, not all patients become anorexic. Consequently, the feeling of hunger in an adult patient with suspected appendicitis should not necessarily be a deterrent to surgical intervention. Occasional patients have urinary symptoms or microscopic hematuria, perhaps because of inflammation of periappendiceal tissues adjacent to the ureter or bladder, and this may be misleading.

Although most patients with appendicitis develop an adynamic ileus and absent bowel movements on the day of presentation, occasional patients may have diarrhea. Others may present with small bowel obstruction related to contiguous regional inflammation. Therefore,

appendicitis needs to be considered as a possible cause of small bowel obstruction, especially in patients without prior abdominal surgery.

PHYSICAL EXAMINATION

Patients with acute appendicitis typically look ill and are lying still in bed. Low-grade fever is common ($\approx 38^{\circ}\text{C}$). Examination of the abdomen usually reveals diminished bowel sounds and focal tenderness, with voluntary guarding. The exact location of the tenderness is directly over the appendix. Usually, this occurs at McBurney's point, located one third of the distance along a line drawn from the anterior superior iliac spine to the umbilicus; however, the normal appendix is mobile, so it may become inflamed at any point on a 360-degree circle around the base of the caecum. Thus, the site of maximal pain and tenderness can vary.

Peritoneal irritation can be elicited on physical examination by the findings of voluntary and involuntary guarding, percussion, or rebound tenderness. Any movement, including coughing (Dunphy's sign), may cause increased pain. Other findings may include pain in the right lower quadrant during palpation of the left lower quadrant (Rovsing's sign), pain on internal rotation of the hip (obturator sign, suggesting a pelvic appendix), and pain on extension of the right hip (iliopsoas sign, typical of a retrocecal appendix).

Rectal and pelvic examinations are most likely to be negative. However, if the appendix is located within the pelvis, tenderness on

abdominal examination may be minimal, whereas anterior tenderness may be elicited during rectal examination as the pelvic peritoneum is manipulated.

Pelvic examination with cervical motion may also produce pain in this setting. If the appendix perforates, abdominal pain becomes intense and more diffuse and abdominal muscular spasm increases, producing rigidity. The heart rate rises, with an elevation of temperature above 39° C. The patient may appear ill and require a brief period of fluid resuscitation and antibiotics before the induction of anesthesia.

Occasionally, pain may improve somewhat after rupture of the appendix because of relief of visceral distension, although a true pain-free interval is uncommon.

Symptoms	Score
Migratory right iliac fossa pain	1
Nausea/Vomiting	1
Anorexia	1
Signs	
Tenderness in right iliac fossa	2
Rebound tenderness in right iliac fossa	1
Elevated temperature	1
Laboratory findings	
Leucocytosis	2
Shift to the left of neutrophils	1
Total	10

LABORATORY STUDIES

The white blood cell count is elevated, with more than 75% neutrophils in most patients. A completely normal leukocyte count and differential is found in approximately 10% of patients with acute appendicitis. A high white blood cell count ($>20,000/\text{mL}$) suggests complicated appendicitis with gangrene or perforation.

A urinalysis can also be helpful in excluding pyelonephritis or nephrolithiasis. Minimal pyuria, frequently seen in older women, does not exclude appendicitis from the differential diagnosis because the ureter may be irritated adjacent to the inflamed appendix.

Although microscopic hematuria is common in appendicitis, gross hematuria is uncommon and may indicate the presence of a kidney stone. Other blood tests are generally not helpful and are not indicated for the typical patient with suspected appendicitis. (Samuel et al 2004)

RADIOGRAPHIC STUDIES

Although they are commonly obtained, the indiscriminate use of plain abdominal radiographs in the evaluation of patients with acute abdominal pain is unwarranted.

In one study of 104 patients with acute onset of right lower quadrant pain, interpretation of plain x-rays changed the management of only six patients (6%) and, in one case, contributed to an unnecessary laparotomy. A calcified appendicolith is visible on plain films in only

10% to 15% of patients with acute appendicitis. Although its presence strongly supports the diagnosis in a patient with abdominal pain, the low sensitivity of this test renders it of little value in preoperative decision making.

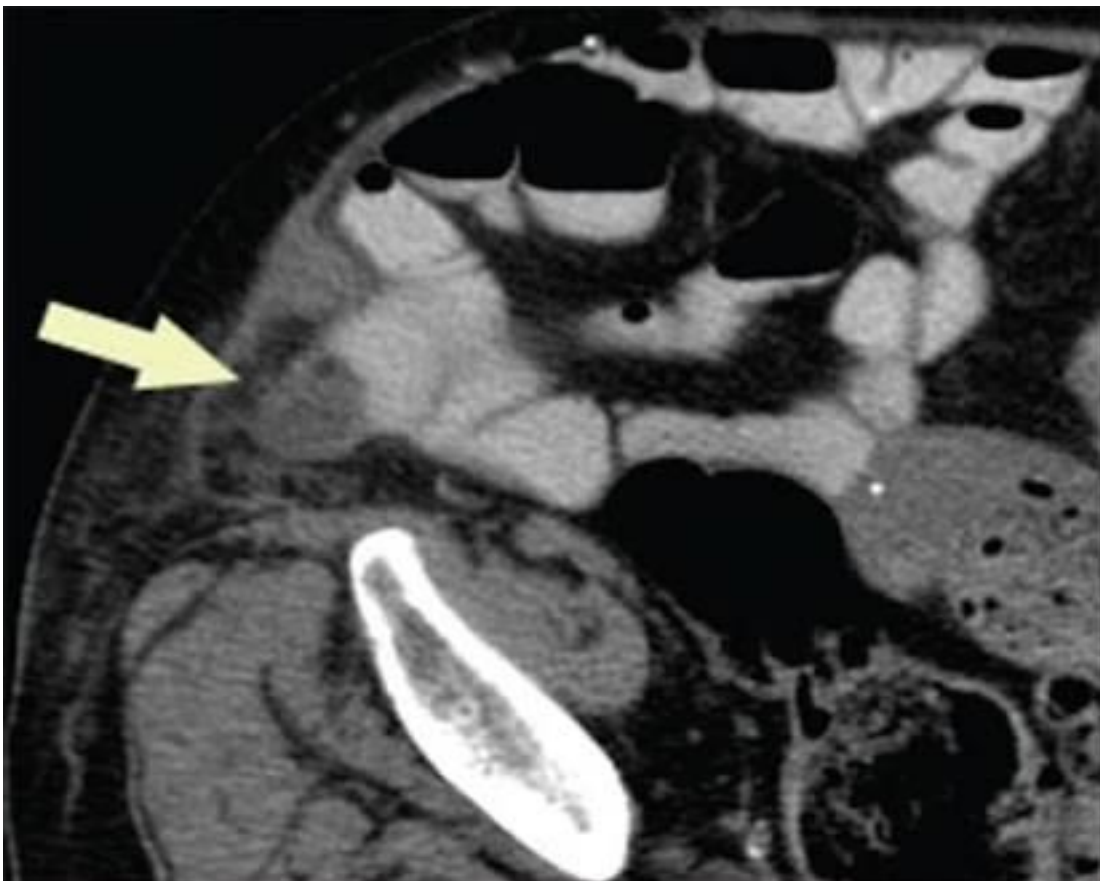
Plain abdominal films may be useful for the detection of ureteric calculi, small bowel obstruction, or perforated ulcer, but such conditions are rarely confused with appendicitis. Failure of the appendix to fill during a barium enema has been associated with appendicitis, but this finding lacks sensitivity and specificity because up to 20% of normal appendices do not fill.

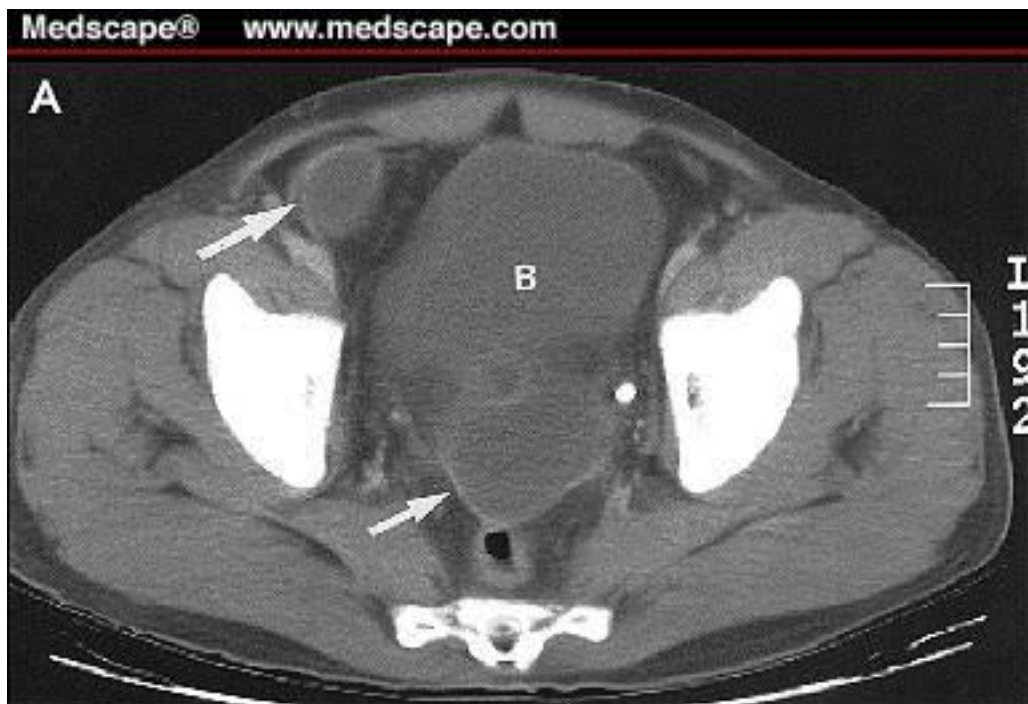
Computed tomography (CT) is commonly used in the evaluation of adult patients with suspected acute appendicitis. Improved imaging techniques, including the use of 5-mm sections, have resulted in increased accuracy of CT scanning, which has a sensitivity of approximately 90% and a specificity of 80% to 90% for the diagnosis of acute appendicitis in patients with abdominal pain.

Results of a recent randomized study have suggested that the use of high-resolution multi detector CT (64- MDCT) with or without oral or rectal contrast results in more than 95% accuracy in the diagnosis of acute appendicitis. In general, CT findings of appendicitis increase with the severity of the disease. (holmes et al,2001)

Classic findings include a distended appendix more than 7 mm in diameter and circumferential wall thickening and enhancement, which may give the appearance of a halo or target. As inflammation progresses, one may see periappendiceal fat stranding, edema, peritoneal fluid, phlegmon, or a periappendiceal abscess. CT detects appendicoliths in approximately 50% of patients with appendicitis and also in small percentage of people without appendicitis.

In patients with abdominal pain, the positive predictive value of the finding of an appendicolith on CT remains high ($\approx 75\%$).





Should CT be used routinely in the diagnostic evaluation of patients with suspected appendicitis?

We do not recommend it, but one study has found that liberal use of CT scans is probably warranted because this has been credited with a declining incidence of negative appendectomy (i.e., the fraction of pathologically normal appendices that are removed).

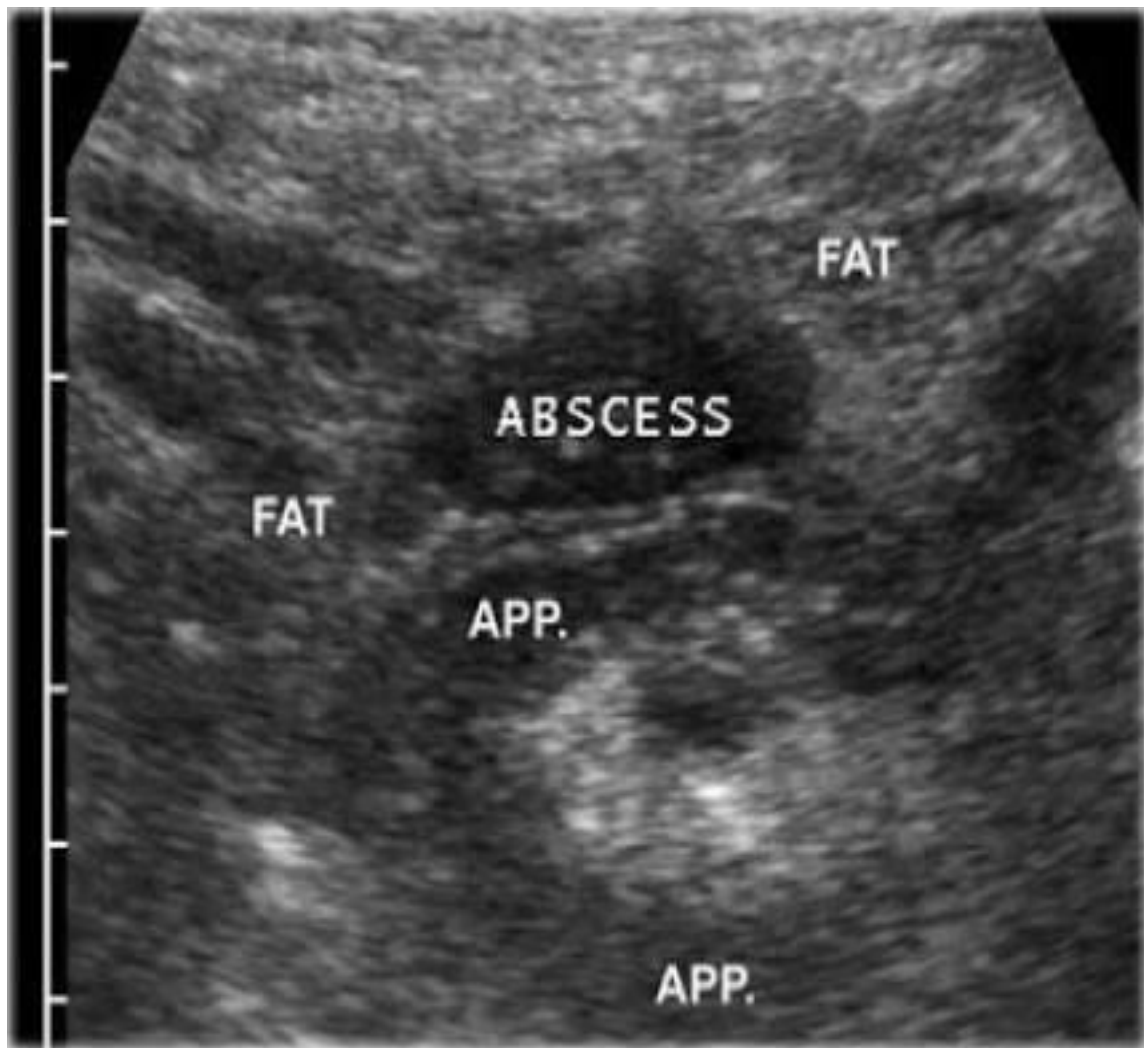
In the setting of typical right lower quadrant pain and tenderness with signs of inflammation in a young male patient, a CT scan is unnecessary, wastes valuable time, may be misinterpreted, and exposes the patient to risks for allergic contrast reaction, nephropathy, aspiration pneumonitis, and ionizing radiation. The latter carries increased risk in children in whom the rate of radiation-induced cancer has been estimated at 0.18% following an abdominal CT scan. CT has proved most valuable for older patients in whom the differential diagnosis is lengthy, clinical findings may be confusing, and appendectomy carries increased risk. Liberal use of cross-sectional imaging seems most appropriate and, as always, the study needs to be performed only in settings in which it has a significant potential to alter management.

Given the recent increased awareness of the risks of cumulative radiation exposure in young adults undergoing CT scanning, it remains to be seen whether magnetic resonance imaging (MRI) will replace CT as the preferred modality for the evaluation of the appendix in younger patients. The morbidity rate of perforated appendicitis far exceeds that of a negative appendectomy.

Thus, the strategy has been to set a low enough threshold for removal of the appendix to minimize the cases of missed appendicitis. With increased use of CT, the frequency of negative explorations has declined in recent years, without an accompanying rise in the number of perforations. An analysis of more than 75,000 patients from 1999 to 2000 revealed a negative appendectomy rate of 6% in men and 13.4% in women. (davison et al,2003)

Among patients with abdominal pain, ultrasonography has a sensitivity of approximately 85% and a specificity of more than 90% for the diagnosis of acute appendicitis. Sonographic findings consistent with acute appendicitis include an appendix of 7 mm or more in anteroposterior diameter, a thick-walled, noncompressible luminal structure seen in cross section, referred to as a *target lesion*, or the presence of an appendicolith. In more advanced cases, periappendiceal fluid or a mass may be found.

Ultrasonography has the advantages of being a noninvasive modality requiring no patient preparation that also avoids exposure to ionizing radiation. Thus, it is commonly used in children and in pregnant patients with equivocal clinical findings suggestive of acute appendicitis. Ultrasonography has been shown to change the disposition of 59% of children with abdominal pain who had already been evaluated by the surgical team.



Disadvantages of ultrasonography include operator-dependent accuracy and difficulty interpreting the images by those other than the operator. Because performance of the study may require hands-on participation by the radiologist, ultrasonography may not be readily available at night or on weekends.

Pelvic ultrasound can be especially useful in excluding pelvic pathology, such as tubo-ovarian abscess or ovarian torsion, which may mimic acute appendicitis.

DIAGNOSTIC LAPAROSCOPY

Although most patients with appendicitis will be accurately diagnosed based on history, physical examination, laboratory studies and, if necessary, imaging studies, there are a small number in whom the diagnosis remains elusive. For these patients, diagnostic laparoscopy can provide a direct examination of the appendix and a survey of the abdominal cavity for other possible causes of pain.

We use this technique primarily for women of childbearing age in whom preoperative pelvic ultrasound or CT fails to provide a diagnosis. Concerns about the possible adverse effects of a missed perforation and peritonitis on future fertility sometimes prompt earlier intervention in this patient population.

MANAGEMENT

OCHSNER SHERREN REGIME

Traditionally it was believed that surgery for appendicular mass is dangerous and could lead to life threatening complications because of edema and friability of structures.

The essential components include

- ❖ Patient position to improve gravitational flow of exudates towards pelvis
- ❖ Nil per oral for first 48hrs
- ❖ Intravenous fluids
- ❖ Intravenous antibiotics
- ❖ Measurement of size of mass
- ❖ If patient improves, then orals started and advised for interval appendicectomy after 6 weeks
- ❖ If treatment fails, surgery is done

OPEN APPENDICECTOMY

The operative approach to AA consists of appendectomy (surgical removal of the vermiform appendix); however, the choice between an open and a laparoscopic operation continues to be debated in the medical literature. The RLQ incision of open appendectomy has persisted essentially unchanged since it was pioneered by McBurney in the 19th century. The use of laparoscopy in the surgical management of AA was first described in 1983, with a continued increasing trend in its use.

As with other laparoscopic surgical procedures, the literature describes decreased pain, earlier resumption of diet, and decreased length of hospital stay for laparoscopic versus open appendectomy. However, this must be objectively considered in the light of the current state of the open procedure, which already engenders minimal risk, an extremely short hospital stay, and a low complication rate. Additional disadvantages of laparoscopy include increased cost and longer operating times.

INDICATIONS

Ever since being described by Mc Burney open appendectomy has been a well established and widely performed operation indicated for patients with AA. Open appendectomy carries minimal risk and has an extremely short length of hospital stay. Open appendectomy is indicated when the surgeon or patient prefers an open procedure. Developing preoperative criteria is crucial in deciding the ideal operative approach for individual patients with AA. Young age (pediatric patients), morbid

obesity, and pregnancy are no longer specific indications for an open procedure.

Contraindications to the laparoscopic approach include the lack of surgical expertise and necessary equipment, severe pulmonary disorders (eg, chronic obstructive pulmonary disease [COPD] and interstitial lung diseases), a bleeding diathesis, severe heart failure, portal hypertension, intolerance of (ie, hypotension due to) Trendelenburg positioning, poor visualization, and severe adhesive disease from previous abdominal surgical procedures.

All equipment must be present in the surgical arena and checked for proper working capacity before the procedure begins. A standard laparotomy set with customary clamps and retractors (Richardson, Regnel, and Roux) is used, along with appropriate sutures and ties.

. PATIENT PREPARATION

Anesthesia

Open appendectomy can be performed with various anesthetic techniques, including general, regional, and local. Routinely, general anesthesia is the first choice, especially in the pediatric population. Studies show that local anesthesia, with anesthetic infiltrated into the subcutaneous and deep tissue layers (including the peritoneum), is a safe and cost-effective practice.

The operative procedure must always start with the surgical time-out. The importance of reviewing the patient identification, surgical team, procedure to be performed, and completion of all preoperative requirements prior to proceeding cannot be overstated. At this point, the patient is ready to be prepared and draped in a sterile fashion.

Positioning

Place the patient supine, and tuck his or her right arm for the duration of the procedure. The surgeon should stand on the patient's right, and the assistant surgeon should stand on the patient's left.

TECHNIQUE

Open appendectomy

On the basis of the anatomy of the anterior abdominal wall, the following three distinct incisions can be employed when performing an open appendectomy: McBurney-McArthur incision Lanz incision

Pararectus (Jalaguier, Battle, Kammerer, Lennander, Senn) incision Whether any of these incisions is superior to the others has not been decided in the medical literature; the final determining factor is the individual surgeon's preference. The technique described below uses the McBurney-McArthur incision.

The position of the incision is based upon the location of the McBurney point, which is a point one third of the distance from the anterior superior iliac spine (ASIS) to the umbilicus. Place the incision (1.5-5.0 cm in length, depending on the patient's age) between the first third and the second third of the distance from the ASIS to the umbilicus, respecting the directions of the Langer skin lines. (See the image below.)

Skin incision is based on McBurney point, which lies one third of distance between anterior superior iliac spine (ASIS) and umbilicus. Incision extends 3-5 cm along skin creases (Lanz incision).

Make the incision with a No. 10 blade; use a Bovie electrocautery to incise through both the superficial (Camper) and the deep (Scarpa) fascia. (See the image below.)

Dissection through both superficial (Camper) and deep (Scarpa) fascia. External oblique aponeurosis is exposed and incised in direction of fibers.

Expose the external oblique aponeurosis, incising in the direction of fibers, and split the external oblique muscle bluntly with alternating Kelly clamps and Roux retractors. (See the image below.)

External oblique muscle is split bluntly by using alternating Kelly clamps and Roux retractors. This blunt muscle spreading, along with appropriate retraction (again, the authors feel that the Roux retractor is the best), allows visualization of the transversalis fascia and the peritoneum. (See the image below.)

Sequence of muscle splitting and retraction is repeated with fascia of both internal oblique muscle and transversus abdominis to expose transversalis fascia and peritoneum. Perform the incision on peritoneum in a craniocaudal direction with Metzenbaum scissors, allowing access to the peritoneal cavity; once the cavity is opened, any fluid encountered should be sent for Gram stain and culture. (See the image below.)

Transversalis fascia and peritoneum are grasped with 2 straight clamps, with palpation between surgeon's fingers, and with care taken to avoid entrapment of any underlying structures. Incision is made with Metzenbaum scissors, and peritoneal cavity is entered.

The appendix can be removed through either an antegrade or a retrograde technique. In performing the ante grade approach, identify the ascending colon and its taeniae coli, and use a series of Babcock surgical clamps to follow them to their convergence, identifying the base of the appendix. Free the appendix meso appendix complex

from its adjacent, often inflamed, tissue, and deliver it into the wound. The mesoappendix, containing the appendiceal artery, is then ligated and separated from the appendix. (See the image below.)

In antegrade approach, ascending colon and its taeniae coli are identified and followed to their convergence, identifying base of appendix. Appendix-mesoappendix complex is freed from its adjacent, often inflamed, tissue and delivered into wound. Mesoappendix, containing appendiceal artery, is ligated (3-0 Vicryl 2 times) and separated from appendix.

The appendix can be removed in various ways, including simple ligation (the authors' preference), purse-stringing, and inversion appendectomy. The actual method of resection has not been shown to make a significant difference in wound infection, length of hospital stay, postoperative fever, and intra-abdominal abscesses.

The authors' preference is as follows. Once the mesoappendix is divided and the appendiceal/cecal base is clearly exposed, perform simple ligation with 2-0 plain polyglactin, tying off the base; this ligation is performed twice. Place a clamp just proximal to the distal ligature on the appendix, avoiding any inadvertent contamination, and divide sharply. Cauterize the exposed mucosa. (See the image below.)

Completion of appendectomy by dividing appendix between 2 ligatures, closer to cecum.

The retrograde technique is used under the following circumstances:

The appendix is very inflamed, and manipulation may cause perforation

The appendix is in a retroperitoneal position

The appendix is surrounded by inflammatory tissue, omentum, or both, which makes identification difficult

In the retrograde technique, the base of the appendix is found first, exposed, ligated, and transected. Attention is then turned to the mesoappendix, which is ligated last.

After the appendectomy is completed and the wound is copiously irrigated with normal saline, grasp the peritoneum with two straight clamps, and close it with a continuous 3-0 polyglactin stitch. Approximate all split muscle layers, using 3-0 polyglactin at each level. Close the external oblique fascia with a continuous 2-0 polyglactin stitch. Approximate the Scarpa fascia with 3-0

polyglactin, and use 4-0 poliglecaprone subcuticular interrupted sutures for skin closure.

If wound contamination is of concern in complicated appendicitis, the wound may be closed at the musculofascial level, left open and packed for 3-5 days, and secondarily closed. Another option is to leave a Penrose drain in the wound and remove it 2-3 days later. If a phlegmon or abscess is encountered, the abdomen should be thoroughly irrigated with normal saline. Closed suction drainage may be used in these circumstances or if the adequacy of appendiceal stump closure is of concern. According to a 2015 Cochrane review, it is unclear whether routine abdominal drainage is effective in preventing intraperitoneal abscesses after open appendectomy for complicated appendicitis.

Postoperative care

After completion of the surgical procedure, the patient should be encouraged to ambulate, with appropriate pain control. The diet is advanced as tolerated with plans for discharge on postoperative day 1 for noncomplicated appendicitis. Discharge instructions consist of pain management, instructions on indications for urgent return to the emergency department, and an office appointment in 1 week's time.

The postoperative outpatient office visit evaluates the patient's continued progression with a detailed history and physical examination, discussion of the final pathology, and evaluation of the surgical wound. Resumption of normal activity occurs within 1 day following the procedure; adequate analgesia allows safe return to daily duty.

Complications

The morbidity and mortality of acute appendicitis (AA) are related to the stage of the disease at presentation, and both are notably higher in cases of perforation.

The mortality figures for nonperforated and perforated appendicitis are 0.8 and 5.1 per 1000 cases, respectively.[27] The average rate of perforation at presentation is 16-30%, but in elderly and young patients, it is significantly increased because of delays in diagnosis.[28]

Early

Common early complications associated with any technique include bleeding, surgical site infection (SSI), intra-abdominal abscess, unrecognized enteric injury, and fistula formation.

SSIs are determined by the level of intraoperative wound contamination, with rates of infection ranging from less than 5% in simple appendicitis to 20% in patients with perforation. In a meta-analysis of 54 randomized clinical trials comparing laparoscopic versus open appendectomy, SSIs were less likely after laparoscopic appendectomy than after open appendectomy. Whatever surgical approach is chosen, preoperative intravenous antibiotics have been shown to decrease the postoperative rate of SSI.

In the postoperative period, fluctuating pyrexia, along with worsening diarrhea, may give clues to the formation of intra-abdominal or pelvic abscesses, specifically after gross contamination of the peritoneal cavity. The incidence of intra-abdominal abscesses is increased nearly threefold after laparoscopic appendectomy.[6]

The diagnosis can be confirmed by means of either ultrasonography or computed tomography (CT); treatment consists of radiologic drainage and continued intravenous antibiotics. Other early complications primarily include anterior abdominal wall vessel injury, enteric leaks from unrecognized injuries, and postoperative ileus and fistula formation.

Late

Late complications consist of incisional hernia, stump appendicitis (recurrent infections from a retained appendiceal stump), and small-bowel obstruction. Smallbowel obstruction occurs in fewer than 1% of patients after appendectomy for uncomplicated appendicitis and in 3% of patients with perforated appendicitis who are monitored for 30 years. About one half of these patients present with bowel obstruction during the first year.

Complicated appendicitis

Complicated appendicitis includes gangrenous or perforated appendicitis or the presence of an appendicular abscess or phlegmon. The white blood cell (WBC) count, the granulocyte count, and the C-reactive protein (CRP) level have stronger discriminatory capacity for perforated appendicitis. High WBC and granulocyte counts and an increased CRP concentration are relatively strong predictors of perforated appendicitis, with a likelihood ratio as high as 7.20.

These cases are traditionally managed conservatively by administering intravenous antibiotics and draining an evolving abscess, if indicated; however, this approach, again, has been questioned in the medical literature. An important caveat in this treatment algorithm is the absence of peritoneal signs.

Because of the delay in seeking diagnosis and treatment, the recovery time and the corresponding length of hospital stay are found to be significantly longer with this approach than with appendectomy performed at the time of presentation.

An interval appendectomy in the presence of a diagnosed fecolith is the surgical approach that is currently en vogue. Patients aged 40 years and older may benefit from further investigations (eg, colonoscopy) and close follow-up

Laparoscopic Appendectomy

Although not mandatory, a Foley catheter is helpful in decompressing the bladder, thereby maximizing the viewing field and improving working space. Before the procedure, take time for a surgical timeout, highlighting the patient, surgical team, procedure to be performed, and completion of all preoperative requirements. At this point, the patient is ready to be positioned as previously described and prepared and draped in a sterile fashion. Placement of trocars Make a 2-cm supraumbilical curvilinear incision directly above the umbilicus. Perform meticulous dissection with the electrocautery through the subcutaneous tissue, beyond the Scarpa fascia, down to the linea alba, skeletonizing the fascia. Snowden-Pencer Hasson S retractors provide good visualization and angulation for incising the fascia in a longitudinal direction, for approximately 2 cm. Grasp the just-incised fascial edges with two straight

clamps, allowing both to be brought into the operating field. To provide anchoring for placement of the 12-mm Hasson trocar in the future steps, place a 0 polyglactin UR stitch in the midline of both fascial edges. Continue blunt dissection with the S retractors to allow visualization of the peritoneum. Grasp the peritoneum with two straight clamps, side by side, in a horizontal manner. Use the fingertips to palpate the newly grasped peritoneum for any intra-abdominal contents. Use Metzenbaum scissors to cut 2-cm longitudinal incisions for entry into the peritoneal cavity. Then gently introduce the Hasson trocar through this defect and initiate carbon dioxide insufflation. Meticulously visualize the entire abdominal cavity. For the placement of the next two 5-mm trocars, place the patient into a steep Trendelenburg position. Place the first trocar to the left of the midline, 1 cm above the pubic ramus. Make a 1-cm horizontal incision. As in all laparoscopic procedures, trocars should be placed under direct vision, with meticulous attention to detail. Be mindful of the demarcation of the dome of the bladder, making sure to stay cephalad, when the port enters the peritoneal cavity. Suprapubic trocar insertion. Great care must be employed to avoid bladder injury. Place the second 5-mm port 2 cm above and medial to the left anterior superior iliac spine (ASIS). With the light of the scope, the vessels of the anterior abdominal wall can be highlighted to provide an appropriate roadmap in entering the abdominal cavity. Visualization of mesoappendix and appendiceal base. Once all of the trocars have been placed and in order to obtain the best

visualization of the proposed target, rotate the patient left side down while maintaining the steep Trendelenburg position. This maneuver allows the small bowel to retract away from the operating field via gravity. Place two atraumatic graspers through the 5-mm trocars, assisting the gravitational pull; grasping both the omentum and small bowel, place them toward the left upper quadrant (LLQ). Locating the appendix should always start with visualization of the right colon. Once the right colon has been identified, follow the taeniae coli down to the confluence at the base of the cecum; this leads directly to the appendix. Use the grasper to clutch the tip of the appendix through the suprapubic port, holding it up and out toward the LLQ. This should provide good visualization of the mesoappendix and the appendiceal base. In certain situations, for better visualization of the appendix, the right colon may have to be mobilized in addition to the ileocolic junction. This can be done with either the hook electrocautery or the Harmonic scalpel. Again, to accomplish this mobilization along the white line of Toldt, grasp the colon through the ASIS port with the right hand, holding the colon up and out toward the LLQ. This clearly reveals the demarcation of the retroperitoneal attachments, allowing dissection through the suprapubic port. A case of an acutely inflamed retrocecal appendix. Harmonic scalpel dissection to reveal the appendiceal base/cecal base as indicated by confluence of the taenia. Division of mesoappendix and excision of appendix The next step is division of the mesoappendix. With the tip of the appendix grasped and placed in the

proper position, an ultrasonic device is used to divide the mesoappendix toward the base of the appendix. The authors prefer the Harmonic Scalpel or the Sonosurg to the Endo-GIA because of inconsistent thickness, which causes a wide disparity in surface area and, hence, hemorrhage after the stapler's deployment. In particular, the Sonosurg is excellent at controlling the appendiceal vessels even when the mesentery is acutely inflamed; moreover, it is reusable, making it very cost-effective. Besides the Endo-GIA 45-mm white cartridge, endoscopic clips are another option for controlling the appendiceal vessels. Once the entire mesoappendix has been coagulated and transected, the appendix should be well skeletonized. (See the video below.) The Harmonic scalpel is then used to cauterize and divide the mesoappendix. Note the excellent view of the cecal/appendiceal base. Remove the scope from the umbilical port and change to a 30° 5-mm scope for placement into the left ASIS port. Place an Endo-GIA 45-mm white cartridge through the umbilical port and, under direct vision, position it across the now clearly delineated base of the appendix/cecum. Capitalizing on the angulation of the 30° scope, carefully check all sides of the stapler. Make sure the stapler is in the appropriate position with nothing inadvertently caught in its jaws. Through this entire process, the left hand remains on the tip of the appendix, maintaining the position of up and out toward the LLQ, thereby delineating the crucial anatomy (elevation of the cecum from its retroperitoneal attachments, with the mesoappendix and appendiceal base in clear sight) for future coagulation

and transecting. Close the stapler and allow 15 seconds to transpire before firing; this permits the surface area to become consistent throughout the entirety of the appendix. Division of the appendix from the cecum above the 2 Endoloops. Carefully inspect both the mesoappendiceal transection line and the appendiceal stump staple line. If any points of hemorrhage are noted, an endoscopic clip (10 mm) or sutures can be applied to the bleeding points. The authors have found that a more cost-effective method for controlling the appendiceal stump is placement of two 0 polyglactin endoscopic loops around the base, rather than using the stapler. Deployment of an Endoloop around the base of the appendix. Place an endoscopic retrieval bag through the umbilical port, and deploy it in the right upper quadrant (RUQ). With the appendix placed inside, close the bag under direct vision. The authors do not remove the specimen at this time, because this would require that the trocar be removed and then reinserted. It is preferable to leave the bag hanging from the umbilical port and place a Kelly clamp on the end of the string for later retrieval. Switch the scopes again (substituting the 5 mm for the 10 mm), and place into the original Hasson supra umbilical port. Again, visualize the appendiceal staple line and the mesoappendix for any abnormalities. Irrigation and suction Irrigate and suction this area, as well as the pelvis. (See the video below.) Irrigating and suctioning of the pelvis are best performed with the surgeon's body repositioned so that his or her back faces cephalad. With the right hand, place the suction irrigator through the

supra pubic port into the pelvis. With the left hand, using an atraumatic grasper with its jaws spread apart, hold away the pelvic contents through the ASIS port. Once irrigation and suction are completed, remove all instruments from the abdominal cavity. Suctioning and irrigation of surgical site and survey of the dissection for hemostasis. Removal of ports and retrieval of specimen .Under direct visualization, remove all ports beyond the fascia, helping to visualize any active hemorrhage. Cease abdominal insufflation, and turn off the light source to the camera/scope. Release the Hasson trocar, and remove it from the abdominal cavity. Retrieve the bag containing the appendix, inspect the specimen thoroughly, and send it to pathology. If difficulty is encountered trying to remove the specimen, the fascial incision may be extended. Closure For closure, place a 0 polyglactin UR stitch, in a figure-eight fashion, through the linea alba/fascia to close the supraumbilical port. Infiltration of local analgesia at the trocar sites at the completion of the procedure is helpful for postoperative pain control. All incisions are closed with interrupted 4-0 polyglactin or poliglecaprone sutures. Apply Dermabond to reinforce closure of the skin

METHODOLOGY

AIMS AND OBJECTIVE

- ❖ To analyse and compare the clinical response of appendicular mass and abscess treated conservatively and surgically(drainage)
- ❖ To assess the role of interval appendicectomy and its benefit during the follow up of these cases.

DESIGN OF THE STUDY

Prospective study

ETHICS CLEARANCE

Applied

CONSENT

An informed consent will be obtained

MATERIAL / SELECTION OF SUBJECT

The patients admitted to various surgical wards in RGGGH for
APPENDICULAR MASS AND ABSCESS

INCLUSION CRITERIA

The patients admitted to various surgical wards in RGGGH as
APPENDICULAR MASS AND ABSCESS

EXCLUSION CRITERIA

- ❖ Appendicular perforation

- ❖ Terminally ill patients
- ❖ Ileocecal tb,ca caecum presenting as RIF mass

DATA COLLECTION & METHODS

A proforma for study of all consecutive patients of APPENDICULAR MASS AND ABSCESS will be used. The presentation, clinical findings and the management will be documented.

ANALYSIS

Various statistical and epidemiological parameters used will be are mean and standard deviation.

PERIOD OF STUDY

JAN 2015 TO JUNE 2016

CONFLICT OF INTEREST

Nil

FINANCIAL SUPPORT

Nil

SAMPLE SIZE

50

These patients are followed up and information collected in the following format

I. PATIENT PARTICULARS:

Name DOA Case No.

Age DOS I.p.No.

Sex DOD Address

Occupation:

II.Diagnosis**III.Chief complaints (with duration)**

A. Abdominal pain

B. fever

C.Other complaints

PAST HISTORY:

HISTORY OF PREVIOUS OPERATION -

DURATION OF DIABETES -

PERSONAL HISTORY:**IV.EXAMINATION:****V.INVESTIGATIONS: CBC ON DAY OF ADMISSION**

X RAY ABDOMEN

USG/CT ABDOMEN

VI.DIAGNOSIS

VII.MANAGEMENT:

MODE OF TREATMENT – CONSERVATIVE / SURGICAL
PROCEDURE WITH INTRA OPERATIVE FINDING

VIII.COMPLICATIONS:

IX.FOLLOW UP:

I.INTERVAL APPENDICECTOMY :

1.LAP / OPEN / LAP CONVERTED TO OPEN

2.POST OP RECOVERY

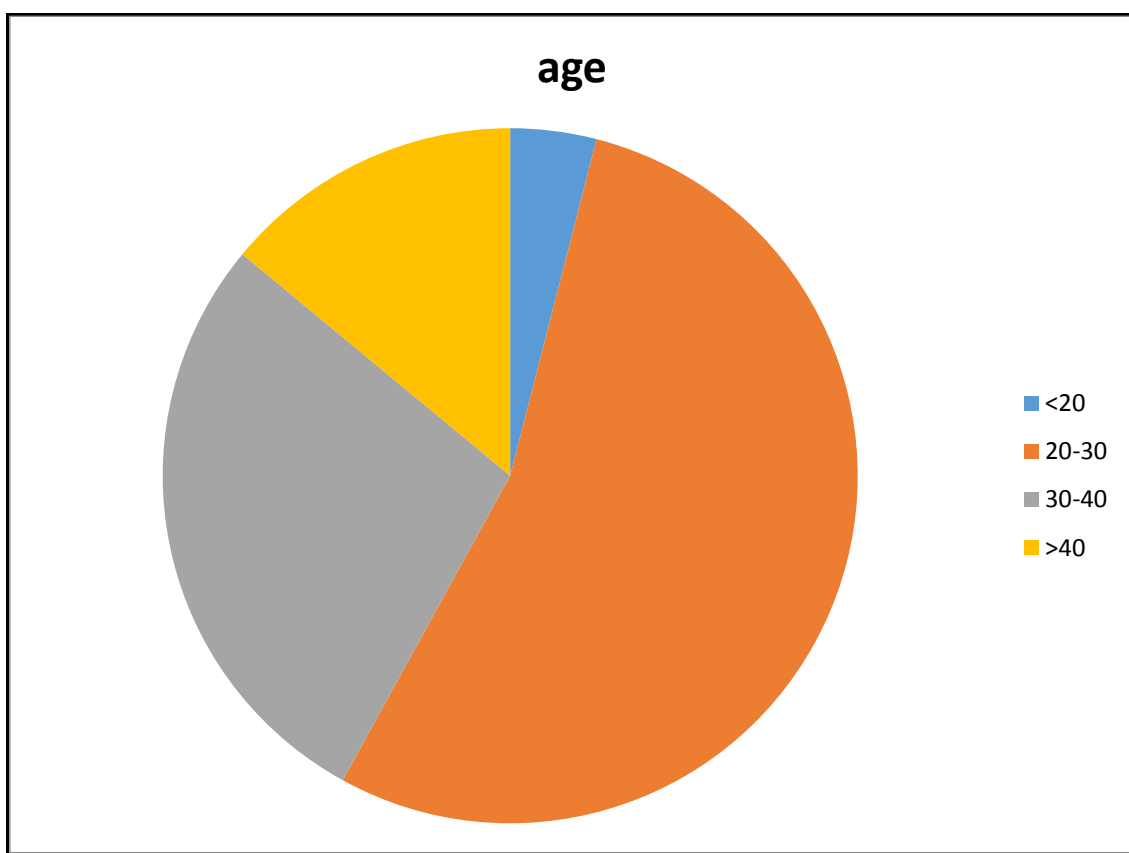
3.COMPLICATIONS

4.HISTOPATHOLOGY

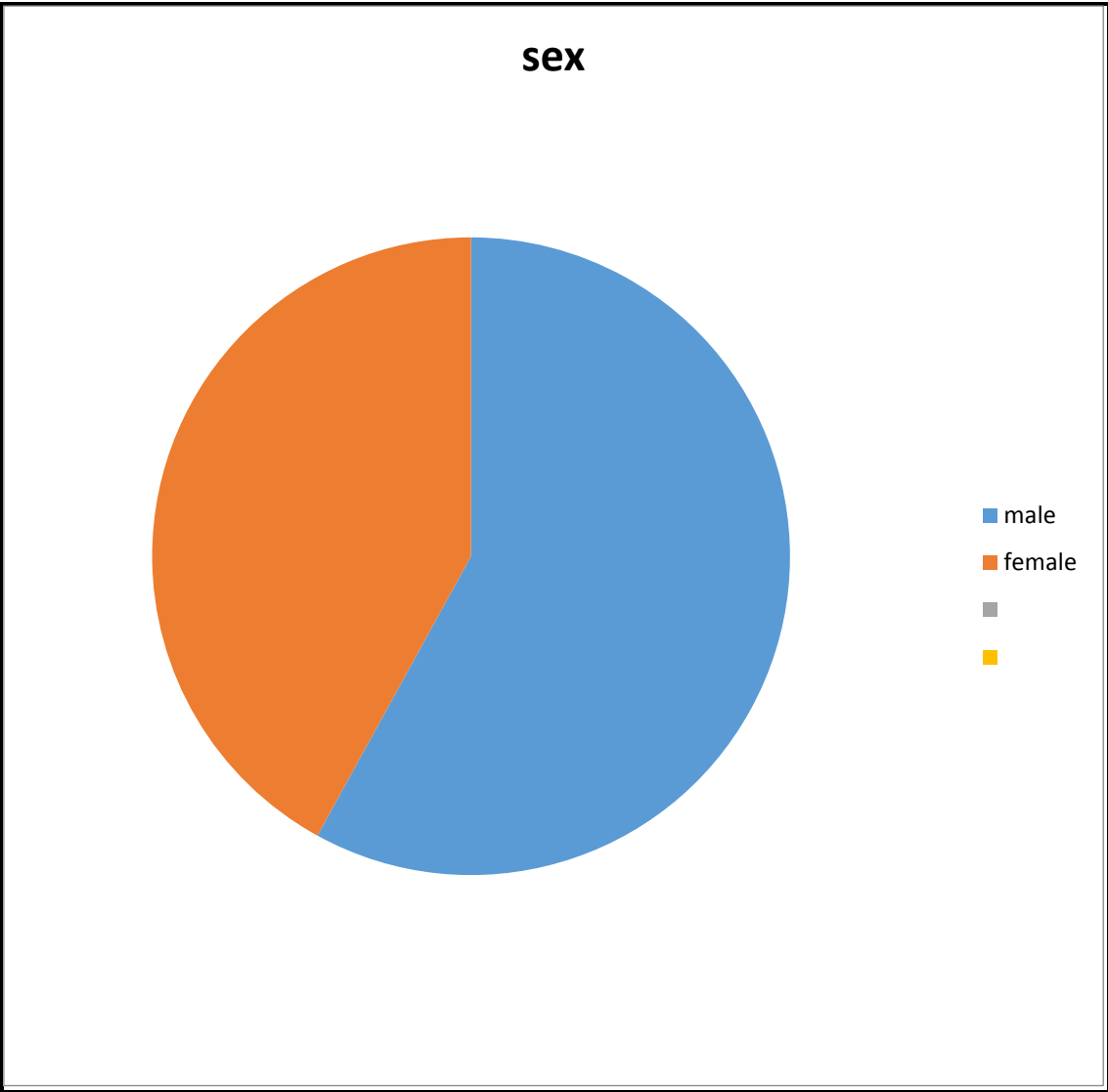
II.ONLY FOLLOW UP :

1.RECURRENCE AT 3 MONTHS

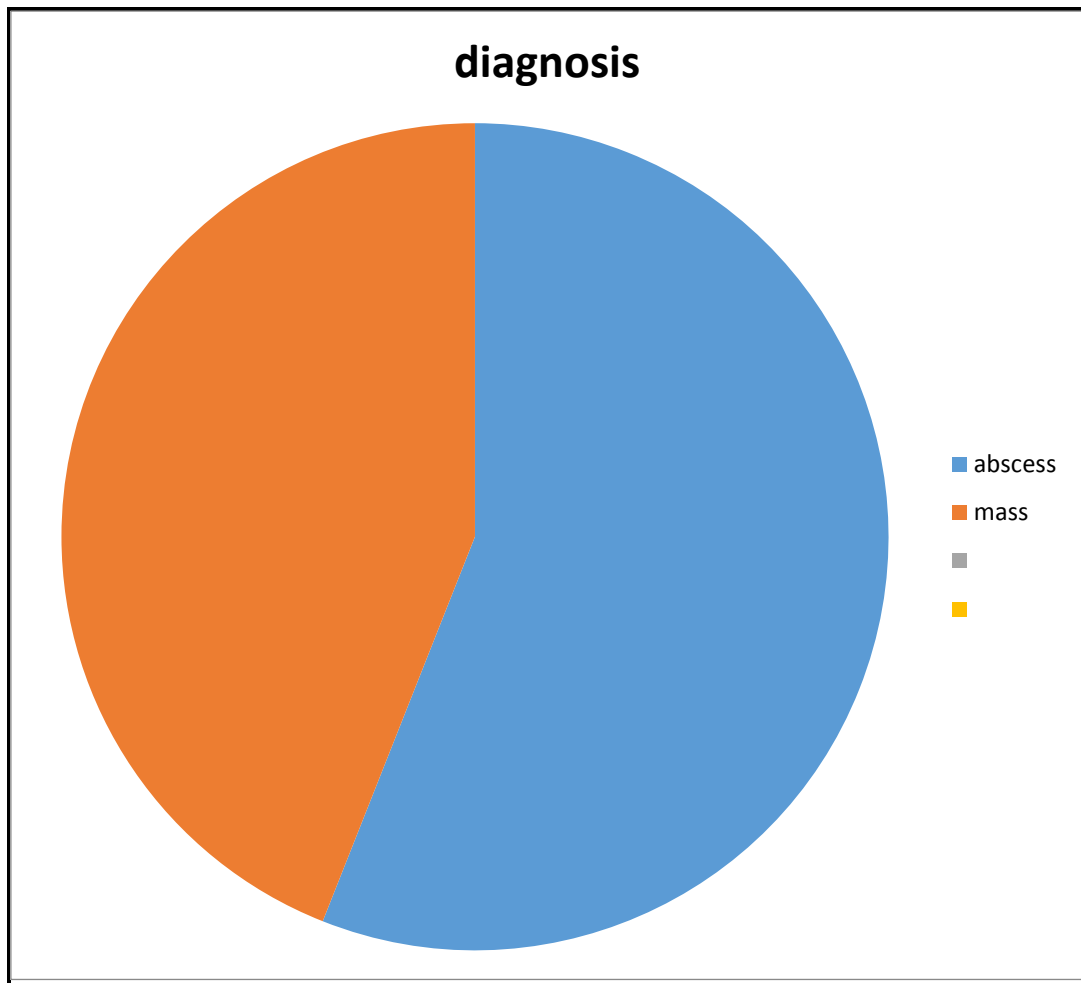
RESULTS



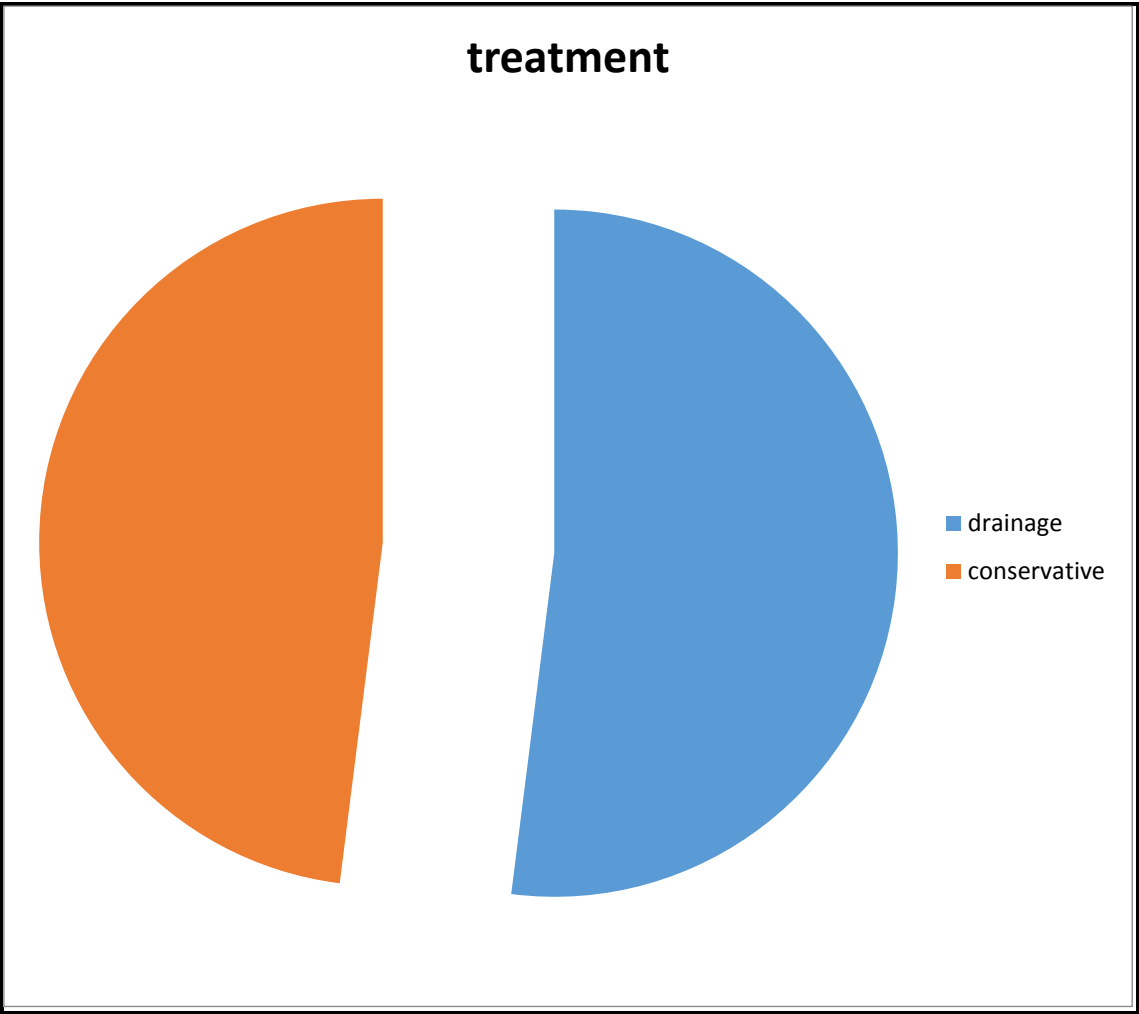
age	Number
<20	2
20-30	27
30-40	14
>40	7



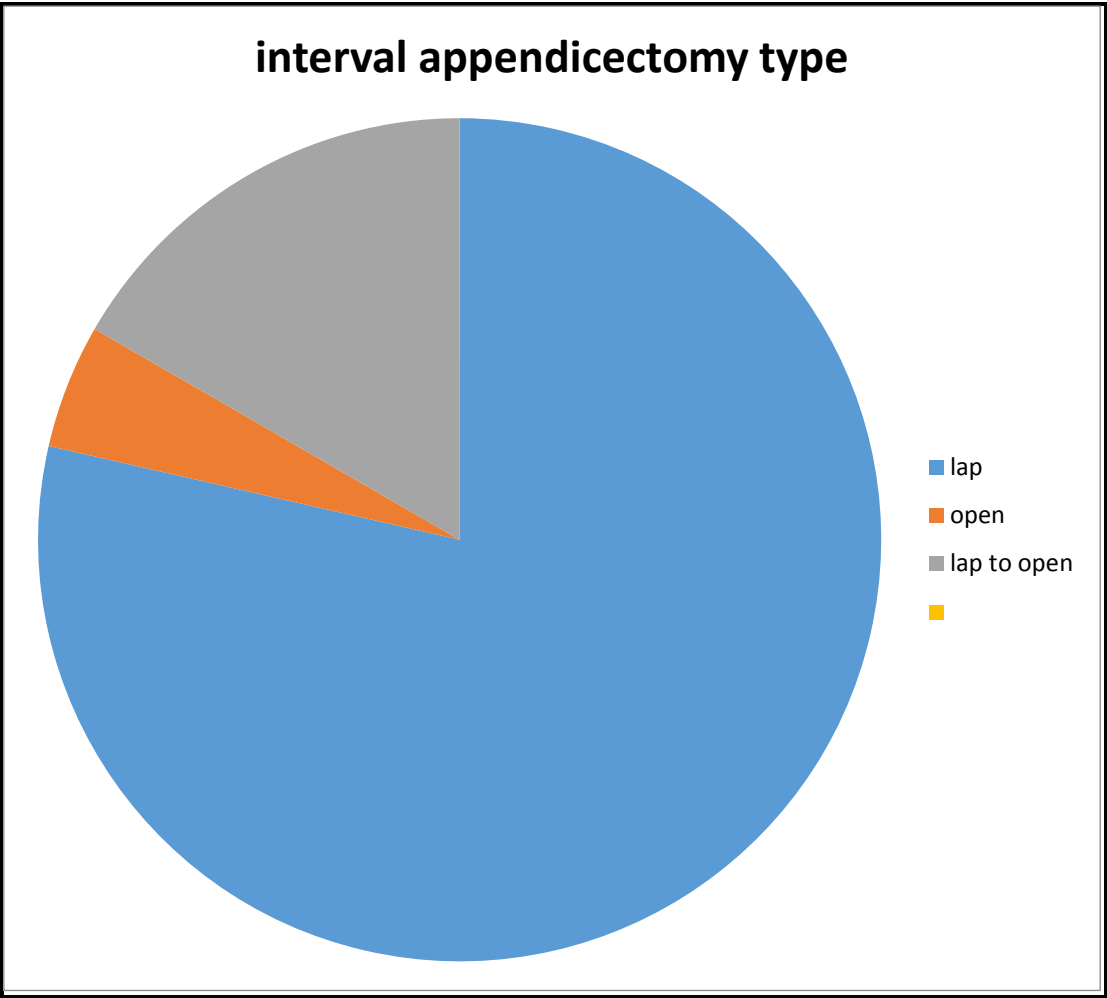
Sex	Number
Male	29
female	21



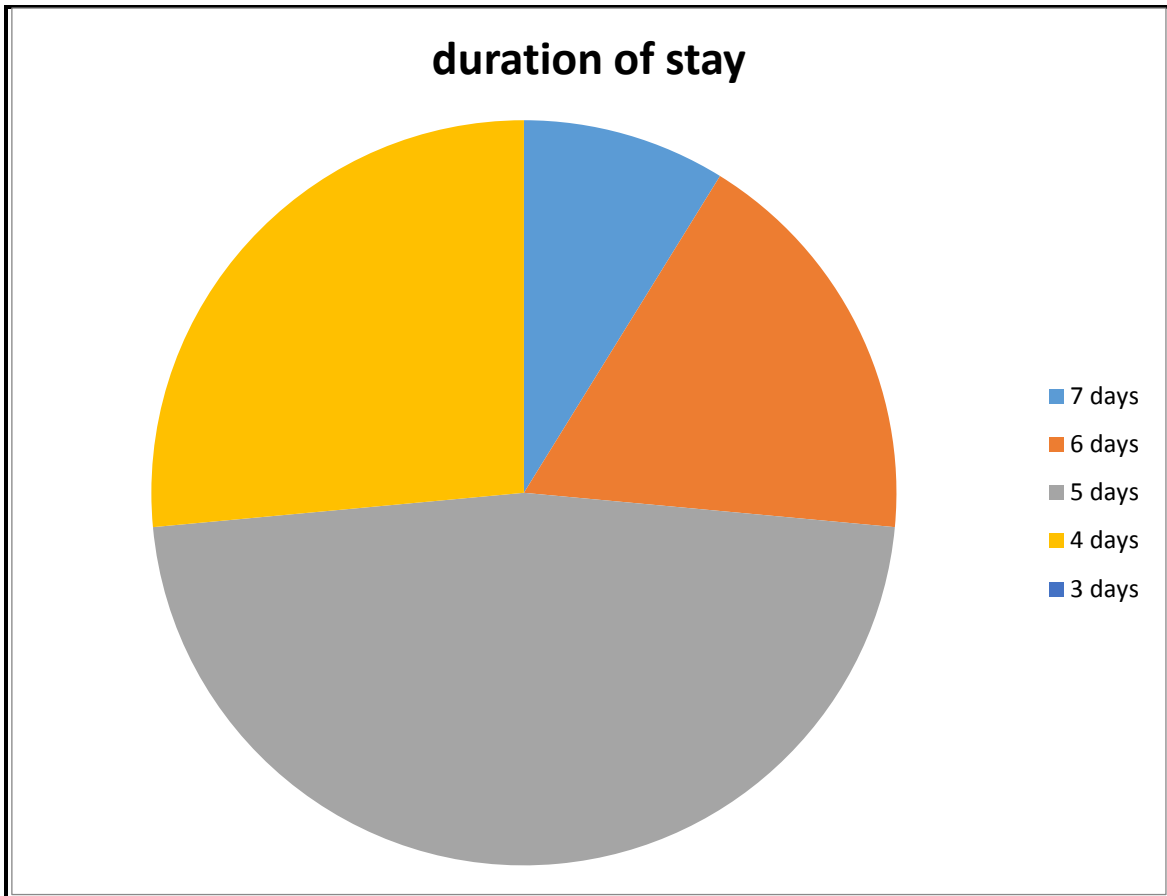
Diagnosis	Number
Appendicular abscess	22
Appendicular mass	28



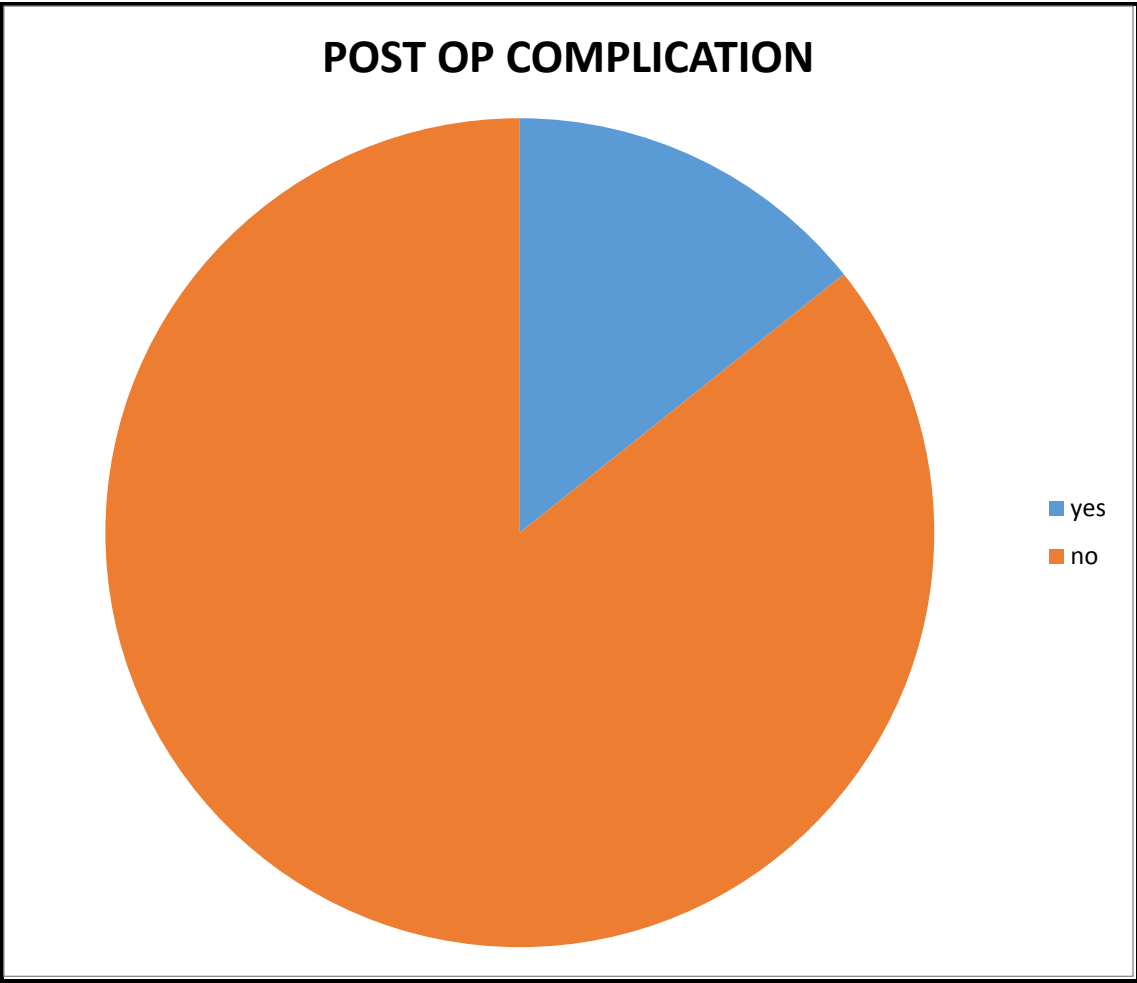
Treatment	Number
Drainage	26
Conservative	24



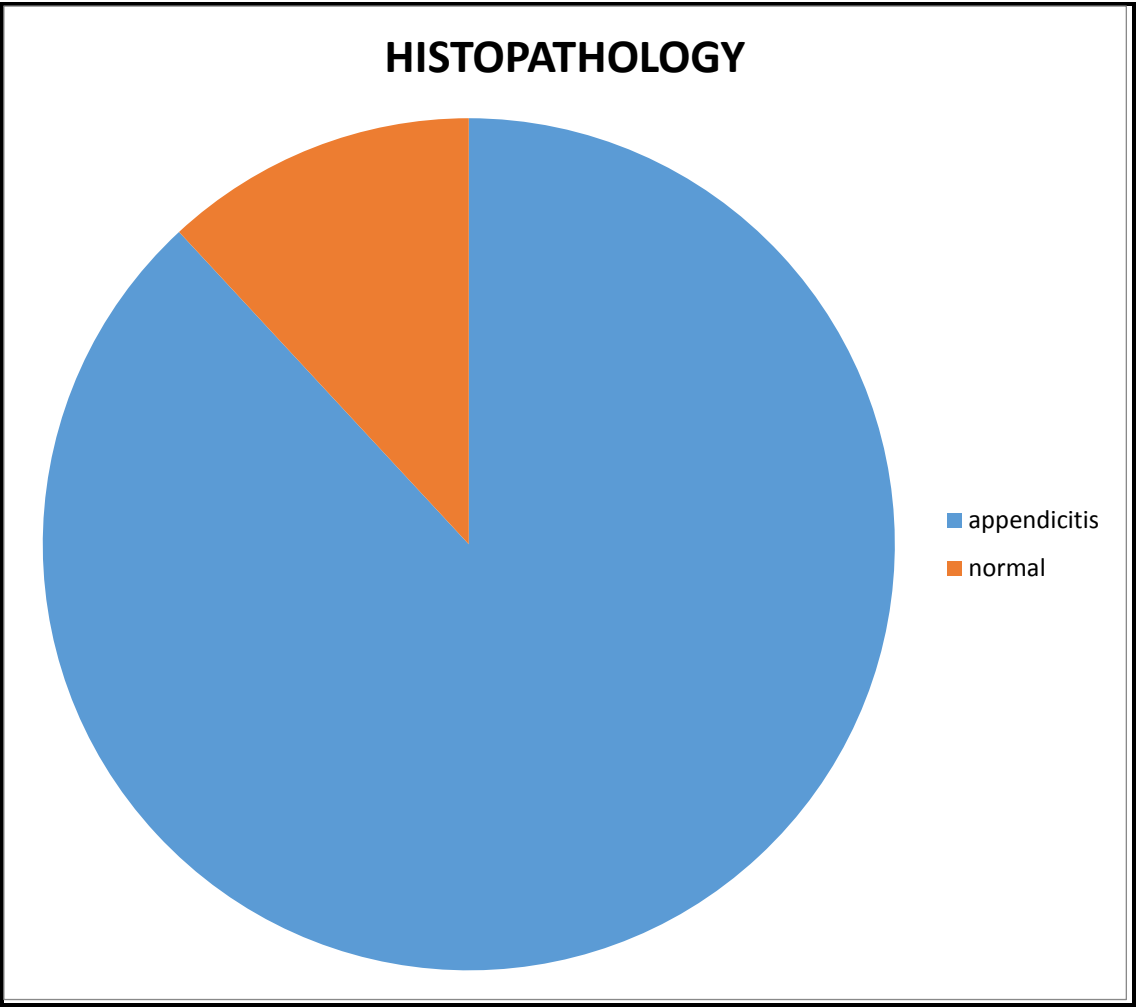
Interval appendicectomy type	Number
Lap	33
Open	2
Lap to open	7



Duration of stay	Number
7 Days	3
6 Days	6
5 Days	16
4 Days	9
3 Days	8

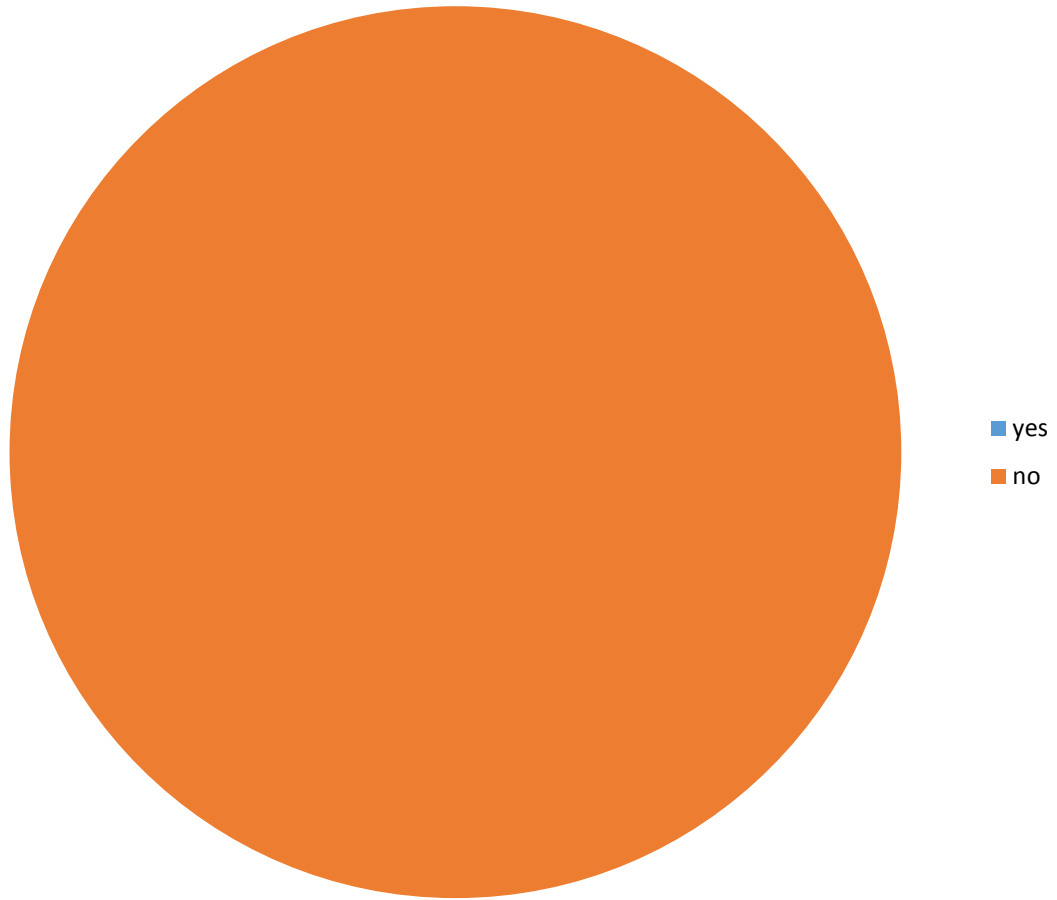


Complication	Number
Yes	6
No	36



Histopathological Examination	Number
Appendicitis	37
Normal	5

recurrence in follow up only cases



DISCUSSION

Appendicitis remains one of the most common diseases faced by the surgeon in practice. It is the most common urgent or emergent general surgical operation performed.

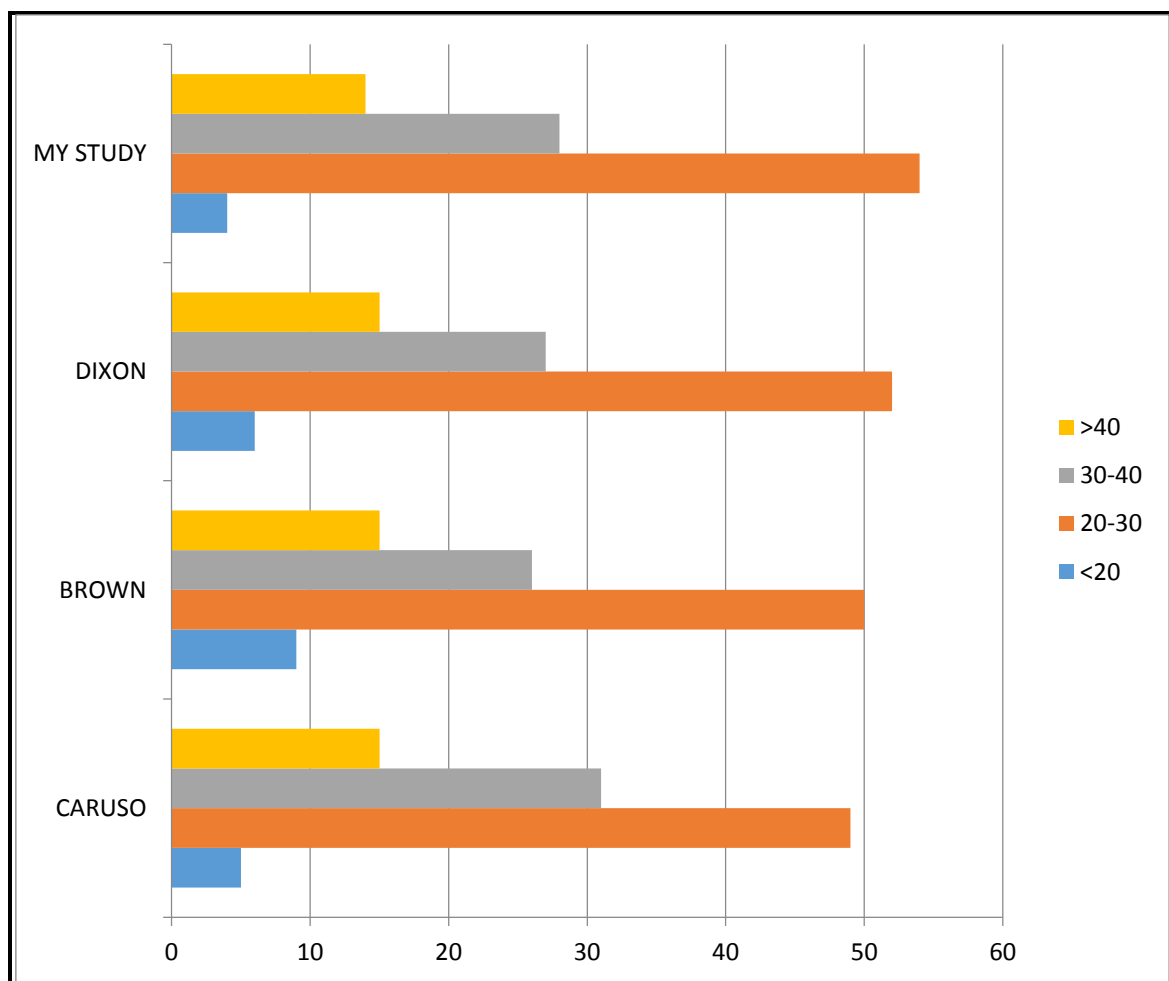
Acute appendicitis is the most common cause of acute abdomen and can be classified into uncomplicated and complicated. The inflammation on appendix may sometimes be enclosed by formation of inflammatory phlegmon or circumscribed abscess. The management of these patients is controversial. These patients are managed conservatively or surgically.

All patients admitted in RGGGH in surgical wards who are diagnosed as appendicular abscess/mass are included in the study. Above mentioned patients are managed conservatively or by surgical drainage without doing appendicectomy

The purpose of the study was to analyse and compare the clinical response of appendicular mass and abscess treated conservatively and surgically (drainage) and to assess the role of interval appendicectomy and its benefit during the follow up of these cases

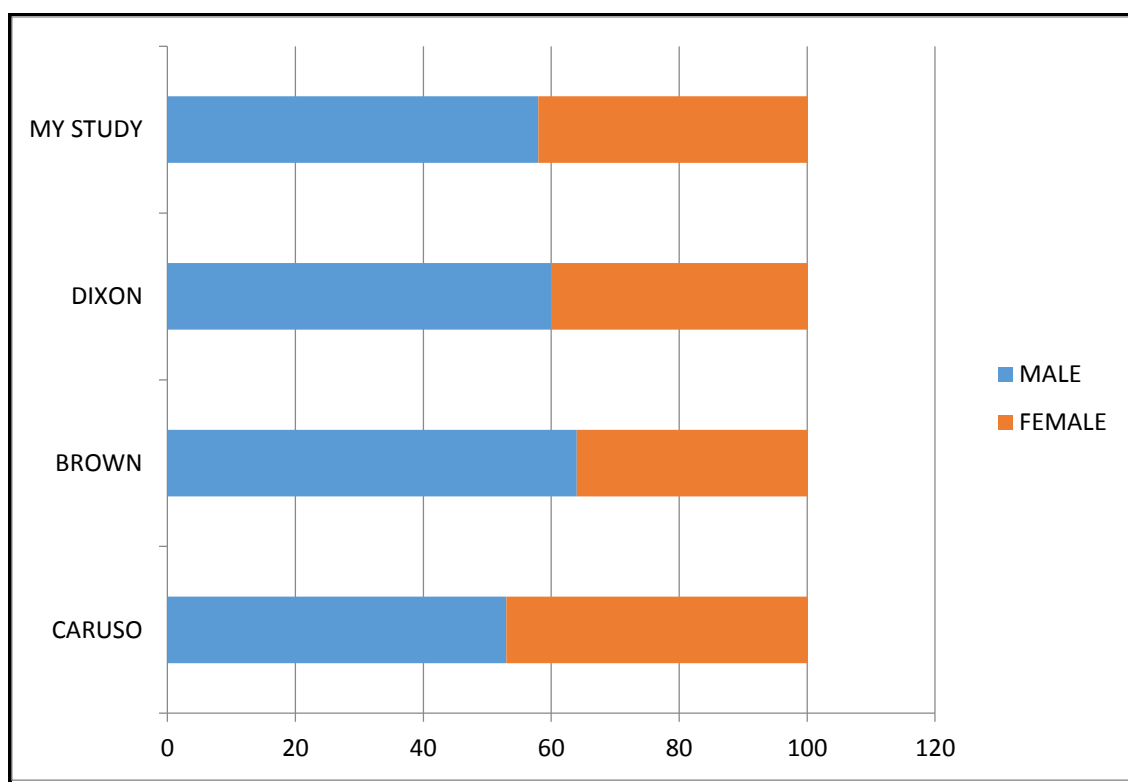
1.AGE DISTRIBUTION

S.NO	STUDY	PERIOD	<20	20-30	30-40	>40
1	CARUSO ET AL.	2014	5%	49%	31%	15%
2	BROWN	2009	9%	50%	26%	15%
3	DIXON ET ALL	2009	6%	52%	27%	15%
4	PRESENT STUDY	2016	4%	54%	28%	14%



2.SEX

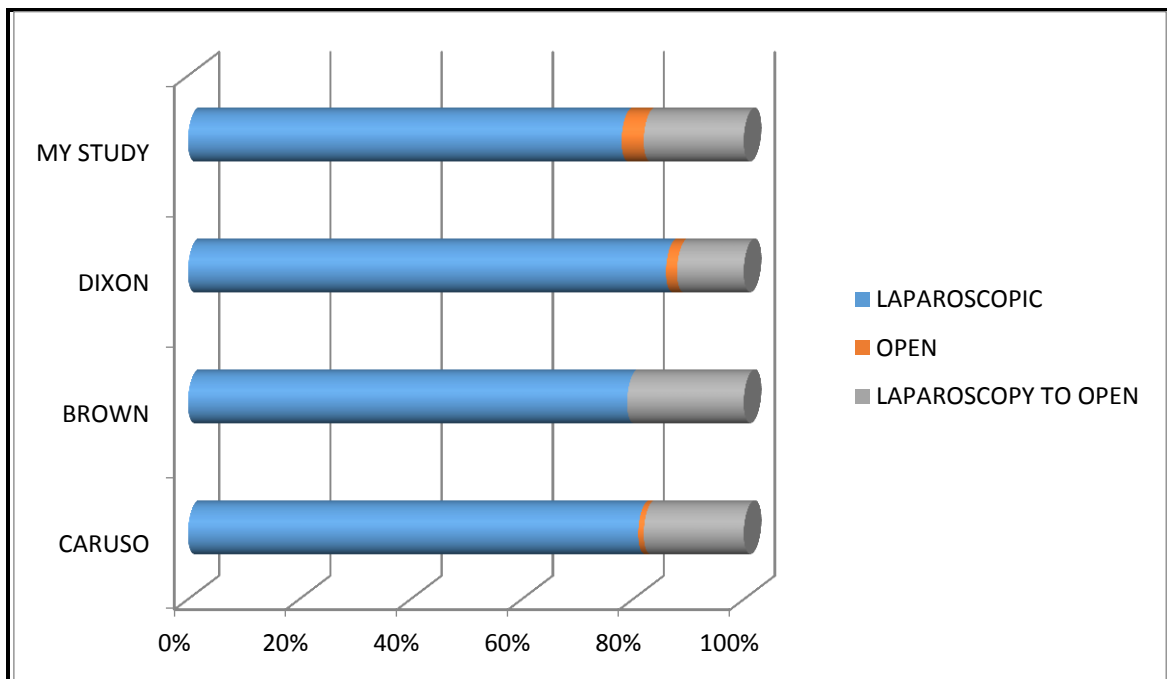
S.NO	STUDY	PERIOD	MALE	FEMALE
1	CARUSO	2014	53%	47%
2	BROWN	2009	64%	36%
3	DIXON	2009	60%	40%
4	PRESENT STUDY	2016	58%	42%



The sex distribution was similar in all studies with male predominance of about 50 to 60%. The female prevalence was about 40 to 50%.

3.TYPE OF INTERVAL APPENDICECTOMY

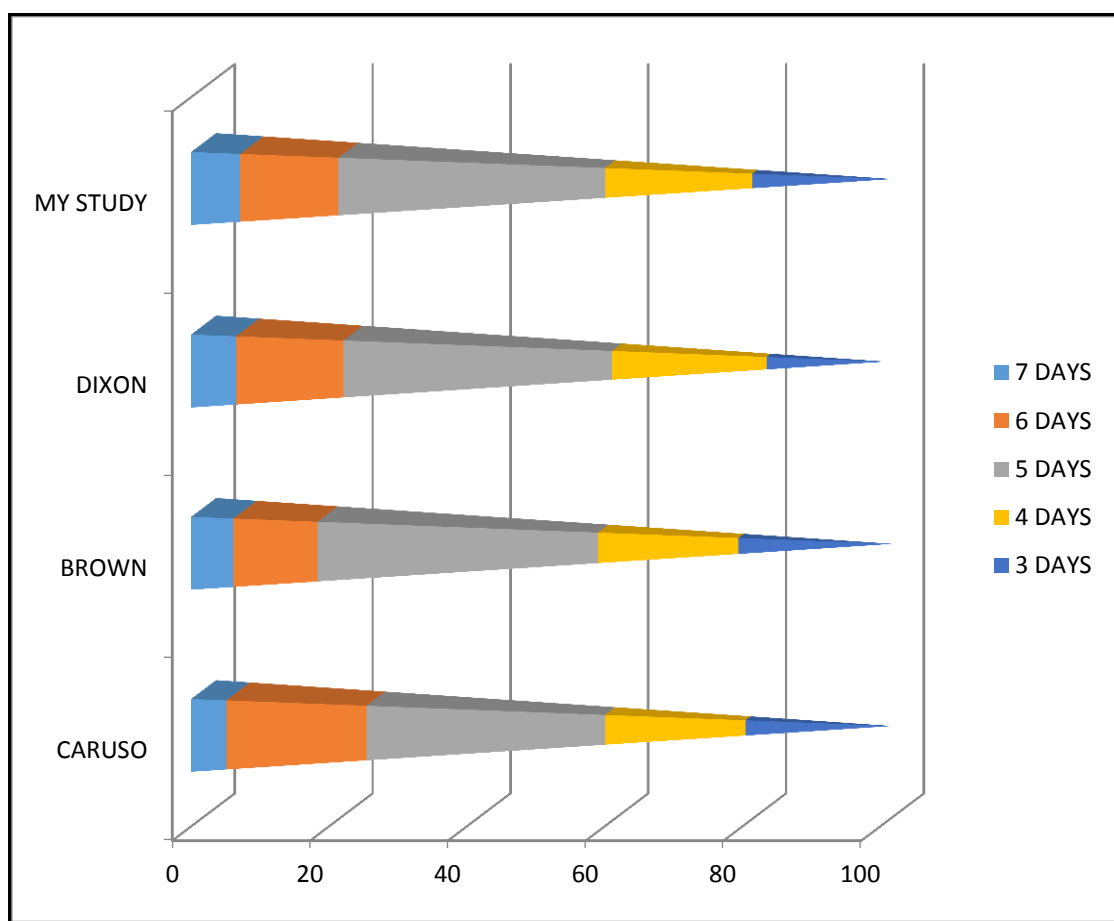
S.NO	STUDY	PERIOD	LAPAROSCOPY	OPEN	LAP TO OPEN
1	CARUSO	2014	81%	1%	18%
2	BROWN	2009	79%	0	21%
3	DIXON	2009	86%	2%	12%
4	PRESENT STUDY	2016	78%	4%	18%



The conversion rate in all studies was around 20% which was relatively higher indicating the questionability of routine interval appendicectomy.

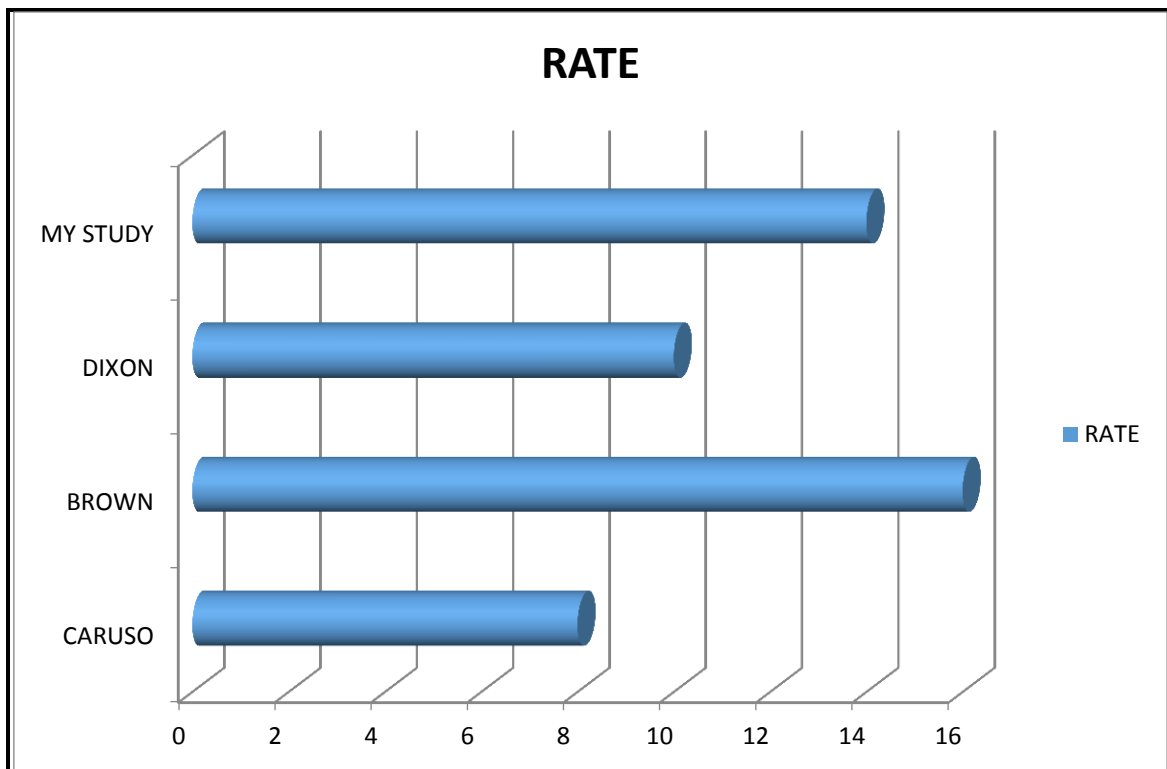
4.HOSPITAL STAY

S.NO	STUDY	PERIOD	7 DAYS	6 DAYS	5 DAYS	4 DAYS	3 DAYS
1	CARUSO	2014	5%	20%	34%	20%	21%
2	BROWN	2009	6%	12%	40%	20%	22%
3	DIXON	2009	6.4%	15.3%	38.3%	22%	17%
4	PRESENT STUDY	2016	7%	14%	38%	21%	20%



5.POST OPERATIVE COMPLICATION RATE

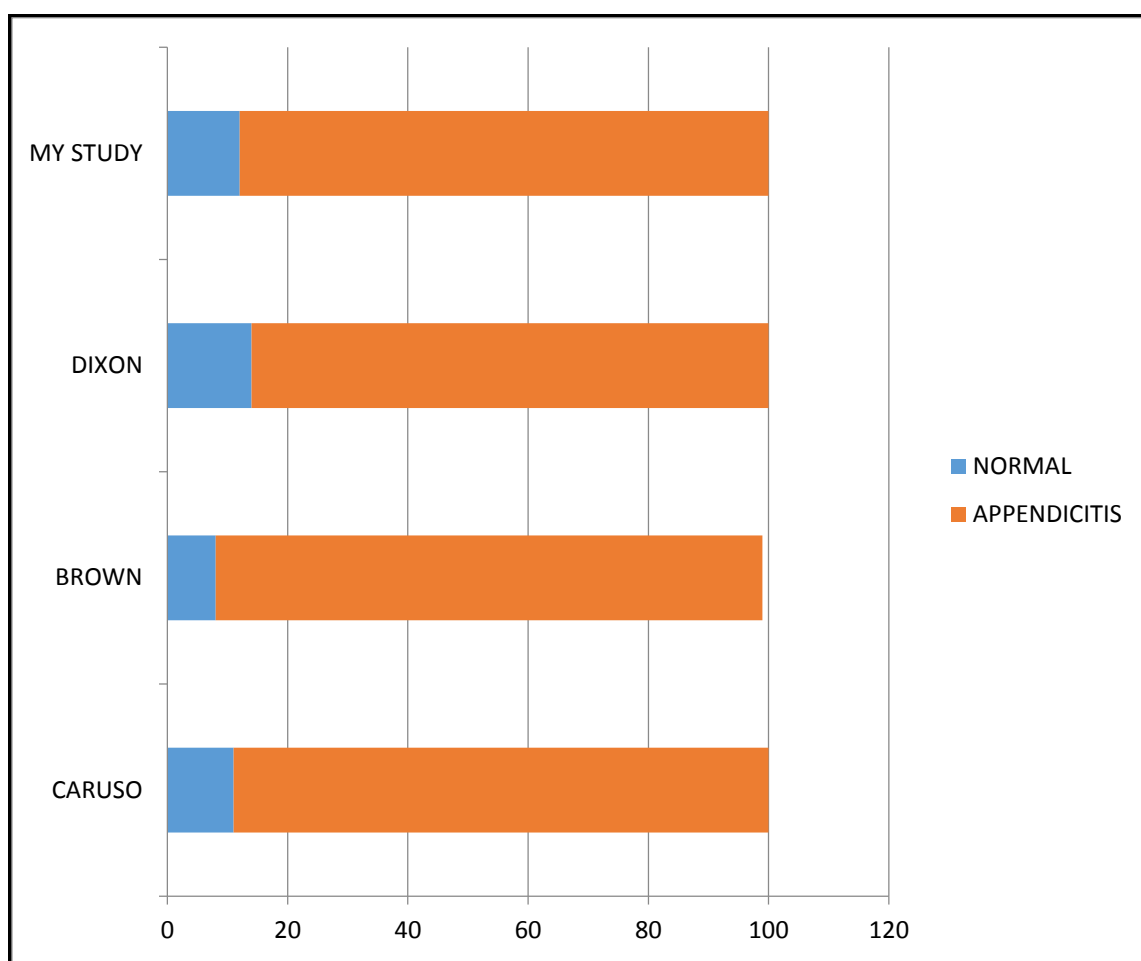
S.NO	STUDY	PERIOD	RATE
1	CARUSO	2014	8%
2	BROWN	2009	16%
3	DIXON	2009	10%
4	PRESENT STUDY	2016	14%



The complications varied ranging from wound infection ,wound gaping,fever upto enterocutaneous fistula. The rate of complication was approximately in one fifth of the cases.

6.HISTOPATHOLOGY REPORTS

S.NO	STUDY	PERIOD	NORMAL APPENDIX	APPENDICITIS
1	CARUSO	2014	11%	89%
2	BROWN	2009	9%	91%
3	DIXON	2009	14%	86%
4	PRESENT STUDY	2016	12%	88%



7. RECURRENCE IN FOLLOW UP CASES

CARUSO ET AL – 2 OUT OF 132 CASES (1.5%)

BROWN – 1 OUT OF 45 CASES(2.22%)

DIXON ET AL – 2 OUT OF 88 CASES (2.27%)

MY STUDY – 0 OUT OF 50 CASES (0%)

The recurrence rate in these cases during follow up was approximately ranging from 0 to 2%.

Thus the practice of doing routine interval appendicectomy in a conservatively managed complicated appendicitis in a asymptomatic case during follow up became questionable due to following factors

- ❖ High conversion rate
- ❖ High complication rate
- ❖ Long hospital stay
- ❖ Low recurrence rate
- ❖ Non significant histopathology in some cases

CONCLUSION

- ❖ Acute appendicitis is the most common cause of acute abdomen and can be classified into uncomplicated and complicated. The inflammation on appendix may sometimes be enclosed by formation of inflammatory phlegmon or circumscribed abscess. The management of these patients is controversial. These patients are managed conservatively or surgically.
- ❖ This study aims to follow up the patients diagnosed as appendicular mass or appendicular abscess treated conservatively or surgically (drainage) and to assess the role of interval appendicectomy and its necessity.
- ❖ All patients admitted in RGGGH in surgical wards who are diagnosed as appendicular abscess/mass are included in the study
- ❖ Above mentioned patients are managed conservatively or by surgical drainage without doing appendicectomy
- ❖ In this study about 50 patients of complicated appendicitis were advocated conservative treatment/surgical drainage. These patients were followed up for about 3 months. During the course some of the patients underwent interval appendicectomy and some underwent conservative line of management

- ❖ Out of the 50 patients included in the study, 29 patients were male and 21 patients were female patients
- ❖ Most of the patients admitted in the hospital diagnosed with appendicitis belonged to the age group 20 – 30 (approximately 54%) followed by 30-40 yrs (28%), then above 40 yrs and below 20 yrs
- ❖ Of the 50 patients admitted, 28 patients were diagnosed as appendicular mass clinically or radiologically and around 22 patients were diagnosed as appendicular mass
- ❖ Out of 28 appendicular mass cases, 24 patients underwent conservative line of treatment and 4 patients went in for surgical drainage. All appendicular abscess patients were surgically drained
- ❖ All these patients were followed up for 3 months
- ❖ About 42 patients underwent interval appendicectomy and other 8 patients continued with conservative line of treatment
- ❖ Among those patients who underwent interval appendicectomy, the distribution of type of procedure is as below
- ❖ Laparoscopic – 33 patients
- ❖ Open – 2 patients
- ❖ Lap converted to open – 7 patients

- ❖ The conversion rate from laparoscopic appendicectomy to open method was little higher compared to cases of acute appendicitis

The duration of hospital stay varied from 3 days to 7 days. The distribution of patients based on the duration of stay is as follows

7 days - 3

6 days -6

5 days -16

4 days - 7

3 days -8

- ❖ Of the 42 cases of interval appendicectomy ,6 cases developed post operative complications like fever,wound infection and wound gaping. The complication rate was little higher than regular cases of appendicectomy
- ❖ Also 5 cases were found to have normal histopathological report indicating complete resolution of infection proving efficacy of conservative antibiotic treatment
- ❖ Also of the eight cases that did not undergo interval appendicectomy ,no case reported with recurrence

- ❖ Based on all these findings, the role of interval appendicectomy is questionable in a conservatively treated case of complicated appendicitis.

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Epub 2008 Jan 16.

ANNEXURES

DATA COLLECTION SHEET

I.Patient particulars:

Name	DOA	Case No.
Age	DOS	I.p.No.
Sex	DOD	Address

Occupation:

II.Diagnosis

III.Chief complaints (with duration)

A. Abdominal pain

B. fever

C.Other complaints

PAST HISTORY:

HISTORY OF PREVIOUS OPERATION -

DURATION OF DIABETES -

PERSONAL HISTORY:

IV.EXAMINATION:

V.INVESTIGATIONS: CBC ON DAY OF ADMISSION

X RAY ABDOMEN

USG/CT ABDOMEN

VI.DIAGNOSIS

VII.MANAGEMENT:

MODE OF TREATMENT – CONSERVATIVE / SURGICAL
PROCEDURE WITH INTRA OPERATIVE FINDING

VIII.COMPLICATIONS:

IX.FOLLOW UP:

I.INTERVAL APPENDICECTOMY :

1.LAP / OPEN / LAP CONVERTED TO OPEN

2.POST OP RECOVERY

3.COMPLICATIONS

4.HISTOPATHOLOGY

II.ONLY FOLLOW UP :

1.RECURRENCE AT 3 MONTHS

**INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI 600 003**

EC Reg.No.ECR/270/Inst./TN/2013
Telephone No.044 25305301
Fax: 011 25363970

CERTIFICATE OF APPROVAL

To
Dr.R.Daniel Ravikumar
Post Graduate in M.S. (General Surgery)
Madras Medical College & RGGGH
Chennai 600 003

Dear Dr.R.Daniel Ravikumar,

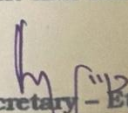
The Institutional Ethics Committee has considered your request and approved your study titled **"FOLLOW UP OF TREATED CASES OF APPENDICULAR MASS AND ABSCESS AND EVALUATING THE NEED OF INTERVAL APPENDICECTOMY "** - **NO.24032016.**

The following members of Ethics Committee were present in the meeting hold on **01.03.2016** conducted at Madras Medical College, Chennai 3

- | | |
|---|---------------------|
| 1.Dr.C.Rajendran, MD., | :Chairperson |
| 2.Dr.R.Vimala,MD.,Dean,MMC,Ch-3 | :Deputy Chairperson |
| 3.Prof.Sudha Seshayyan,MD., Vice Principal,MMC,Ch-3 | : Member Secretary |
| 4.Prof.B.Vasanthi,MD.,Inst.of Pharmacology,MMC,Ch-3 | : Member |
| 5.Prof.P.Raghmani,MS, Dept.of Surgery,RGGGH,Ch-3 | : Member |
| 6.Dr.Baby Vasumathi, Director, Inst. of O&G,Ch-8 | : Member |
| 7.Prof.M.Saraswathi,MD.,Director, Inst.of Path,MMC,Ch-3 | : Member |
| 8.Prof.Srinivasagalu,Director,Inst.of Int.Med.,MMC,Ch-3 | : Member |
| 9.Tmt.J.Rajalakshmi, JAO,MMC, Ch-3 | : Lay Person |
| 10.Thiru S.Govindasamy, BA.,BL,High Court,Chennai | : Lawyer |
| 11.Tmt.Arnold Saulina, MA.,MSW., | :Social Scientist |

We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.


Member Secretary - Ethics Committee
MEMBER SECRETARY
INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE
CHENNAI-600 003

ஆராய்ச்சி ஒப்புதல் படிவம்

ஆராய்ச்சியின் தலைப்பு

குடல்வால் சீழ் கட்டியால் பாதிக்கப்பட்ட நோயாளிகளின் மறு ஆய்வுக் காலம் மற்றும் அறுவை சிகிச்சையின் தேவை பற்றிய ஆராய்வு

ஆய்வு நிலையம் : பொது அறுவை சிகிச்சைத்துறை, ராஜீவ் காந்தி அரசு
பொது மருத்துவமனை, சென்னை மருத்துவக் கல்லூரி
சென்னை - 3.

பங்கு பெறுவரின் பெயர் :

பங்குபெறுபவரின் எண் :

பங்குபெறுபவர் இதனை (✓) குறிக்கவும்

..... என்பவராகிய நான் இந்த ஆய்வின் விவரங்களும் அதன் நோக்கங்களும் முழுமையாக அறிந்துகொண்டேன். எனது சந்தேகங்கள் அனைத்திற்கும் தகுந்த விளக்கம் அளிக்கப்பட்டது. இந்த ஆய்வில் முழு சுதந்திரத்துடன் மற்றும் சுய நினைவுடன் பங்குகொள்ள சம்மதிக்கிறேன்.

எனக்கு விளக்கப்பட்ட விஷயங்களை நான் புரிந்துகொண்டு நான் எனது சம்மதத்தை தெரிவிக்கிறேன். இச்சுய ஒப்புதல் படிவத்தை பற்றி எனக்கு விளக்கப்பட்டது.

இந்த ஆய்வினை பற்றிய அனைத்து தகவல்களும் எனக்கு தெரிவிக்கப்பட்டது. இந்த ஆய்வில் எனது உரிமை மற்றும் பங்கினை பற்றி அறிந்துகொண்டேன்.

இந்த ஆய்வில் பிறரின் நிர்ப்பந்தமின்றி என் சொந்த விருப்பத்தின்பேரில் தான் பங்கு பெறுகிறேன் மற்றும் நான் இந்த ஆராய்ச்சியிலிருந்து எந்நேரமும் பின்வாங்கலாம் என்பதையும் அதனால் எந்த பாதிப்பும் ஏற்படாது என்பதையும் நான் புரிந்துகொண்டேன்.

இந்த ஆய்வில் கலந்துகொள்வதன் மூலம் என்னிடம் பெறப்படும் தகவலை ஆய்வாளர் இன்ஸ்டிடியூசனல் எத்திக்ஸ் கமிட்டியினரிடமோ, அரசு நிறுவனத்திடமோ தேவைப்பட்டால் பகிர்ந்துகொள்ளலாம் என சம்மதிக்கிறேன்.

இந்த ஆய்வின் முடிவுகளை வெளியிடும்போது எனது பெயரையோ, அடையாளங்களையோ வெளியிடப்படாது என அறிந்துகொண்டேன். இந்த ஆய்வின் விவரங்களைக் கொண்ட தகவல் தாளைப் பெற்றுக்கொண்டேன். இந்த ஆய்விற்காக இரத்தப் பரிசோதனை செய்துகொள்ள சம்மதிக்கிறேன்.

இந்த ஆய்வில் பங்கேற்கும் பொழுது ஏதேனும் சந்தேகம் ஏற்பட்டால், உடனே ஆய்வாளரை தொடர்புகொள்ள வேண்டும் என அறிந்துகொண்டேன்.

இந்த ஆய்வில் எனக்கு மருத்துவ பரிசோதனை, இரத்தப் பரிசோதனை மற்றும் இதய உட்பு ஆய்வு பரிசோதனை செய்துகொள்ள முழு மனதுடன் சம்மதிக்கிறேன்.

இச்சுய ஒப்புதல் படிவத்தில் கையெழுத்திடுவதன் மூலம் இதிலுள்ள அனைத்து விஷயங்களும் எனக்கு தெளிவாக விளக்கப்பட்டது என்று தெரிவிக்கிறேன் என்று புரிந்துகொண்டேன். இச்சுய ஒப்புதல் படிவத்தின் ஒரு நகல் எனக்கு கொடுக்கப்படும் என்று தெரிந்துகொண்டேன்.

பங்கேற்பாளர்/ பாதுகாவலர் கையொப்பம்

தேதி:

ஆய்வாளர் கையொப்பம்

தேதி:

ஆராய்ச்சி தகவல்தாள்

ஆராய்ச்சி தலைப்பு

குடல்வால் சீழ் கட்டியால் பாதிக்கப்பட்ட நோயாளிகளின் மறு ஆய்வுக் காலம் மற்றும் அறுவை சிகிச்சையின் தேவை பற்றிய ஆராய்வு

இராஜீவ் காந்தி அரசு பொது மருத்துவமனைக்கு வரும் நோயாளிகளில் குடல்வால் சீழ் கட்டியால் பாதிக்கப்பட்ட நோயாளிகளை பின் தொடர்தல் மற்றும் இடைவேளை அறுவை சிகிச்சையின் தேவை பற்றிய அறிதல் இந்த ஆராய்ச்சியின் நோக்கமாகும்.

மேலே கூறப்பட்ட நோய்க்கு உள்நோயாளியாக இருந்து சிகிச்சை பெற்று வருபவர்களுக்கு மருத்துவ பரிசோதனை, ஆய்வக பரிசோதனை பரிசோதனை செய்யப்படும்.

இந்த ஆராய்ச்சியின் முடிவுகளை அல்லது கருத்துக்களை வெளியிடும் போதோ அல்லது ஆய்வின் போதோ தங்களது பெயரையோ அல்லது அடையாளங்களையோ வெளியிடமாட்டோம் என்பதையும் தெரிவித்துக்கொள்கிறோம்.

இந்த ஆய்வில் பங்கேற்பது தங்களுடைய விருப்பத்தின் பேரில்தான் இருக்கிறது. மேலும் நீங்கள் எந்நேரமும் இந்த ஆய்விலிருந்து பின்வாங்கலாம் என்பதையும் தெரிவித்துக் கொள்கிறோம்.

இந்த சிறப்பு சிகிச்சையின் முடிவுகளை ஆய்வின்போதோ அல்லது ஆய்வின் முடிவின் போதோ தங்களுக்கு அறிவிப்போம் என்பதையும் தெரிவித்துக் கொள்கிறோம்.

ஆய்வாளரின் கையொப்பம்

தேதி

பங்கேற்பாளர் கையொப்பம்

பாதுகாவலர் கையொப்பம்

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S. no	Name	Age	Diagnosis	Sex	Treatment-conservative/ drainage	Interval appendicetomy	Lap/open	Duration of hospital stay	Complication	HPE report	Only follow up	Recurrence at 3 months	Recurrence at 6 months
1	Vijayan	32	Mass	Male	Conservative	Yes	Lap	7	Wound gaping	Appendicitis	-	-	-
2	Lakshmi	29	Abscess	Female	Drainage	Yes	Open	6	Wound gaping	Appendicitis	-	-	-
3	Sundar	26	Abscess	Male	Drainage	Yes	Lap	7	No	Appendicitis	-	-	-
4	Marimuthu	39	Mass	Male	Conservative	Yes	Lap	5	No	Normal	-	-	-
5	Kumar	21	Mass	Male	Conservative	Yes	Lap	6	No	Normal	-	-	-
6	Rajesh	24	Mass	Male	Drainage	Yes	Lap	5	No	Appendicitis	-	-	-
7	Chithra	28	Abscess	Female	Drainage	Yes	Lap	5	No	Normal	-	-	-
8	Vijayalaksmi	36	Mass	Female	Conservative	Yes	Open	6	No	Appendicitis	-	-	-
9	Vignesh	20	Abscess	Male	Drainage	Yes	Lap	5	No	Normal	-	-	-
10	Dakshina moorthy	44	Abscess	Male	Conservative	Yes	Lap to open	7	No	Appendicitis	-	-	-
11	Suresh	23	Mass	Male	Drainage	Yes	Lap to open	7	Wound gaping	Appendicitis	-	-	-
12	Balaji	26	Abscess	Male	Drainage	Yes	Lap	6	No	Appendicitis	-	-	-
13	Krishnan	33	Mass	Male	Conservative	Yes	Lap	4	No	Appendicitis	-	-	-
14	Premkumar	21	Mass	Male	Conservative	Yes	Lap	4	No	Appendicitis	-	-	-
15	Sathya	22	Mass	Female	Conservative	Yes	Lap to open	5	No	Appendicitis	-	-	-
16	Kanchana	30	Mass	Female	Drainage	Yes	Lap	5	No	Appendicitis	-	-	-
17	Sethu	32	Abscess	Male	Abscess	Yes	Lap	4	No	Appendicitis	-	-	-
18	Ramu	29	Mass	Male	Conservative	Yes	Lap	4	No	Appendicitis	-	-	-
19	Vinayagam	28	Abscess	Male	Drainage	Yes	Lap	4	No	Appendicitis	-	-	-
20	Muthu	27	Mass	Male	Conservative	Yes	Lap to open	5	No	Normal	-	-	-
21	Shanmugam	26	Abscess	Male	Drainage	Yes	Lap	4	No	Appendicitis	-	-	-
22	Mohammed	28	Mass	Male	Conservative	Yes	Lap	4	No	Appendicitis	-	-	-
23	Fathima	28	Abscess	Female	Drainage	Yes	Lap	3	No	Appendicitis	-	-	-
24	Mohana	31	Mass	Female	Drainage	Yes	Lap	4	No	Normal	-	-	-
25	Jennifer	26	Mass	Female	Conservative	Yes	Lap	3	No	Appendicitis	-	-	-
26	Sundaramoorthy	37	Abscess	Male	Drainage	Yes	Lap	3	No	Appendicitis	-	-	-

S. no	Name	Age	Diagnosis	Sex	Treatment-conservative/ drainage	Interval appendicetomy	Lap/open	Duration of hospital stay	Complication	HPE report	Only follow up	Recurrence at 3 months	Recurrence at 6 months
27	Jacob	34	Abscess	Male	Drainage	Yes	Lap	4	No	Appendicitis	-	-	-
28	Arumugam	30	Abscess	Male	Drainage	Yes	Lap	5	No	Appendicitis	-	-	-
29	Narasimman	31	Mass	Male	Conservative	Yes	Lap	6	Wound gaping	Appendicitis	-	-	-
30	Vidhya	22	Abscess	Female	Drainage	Yes	Lap to open	6	Wound gaping	Appendicitis	-	-	-
31	Velmurugan	31	Mass	Male	Conservative	Yes	Lap	5	No	Normal	-	-	-
32	Kaviya	26	Mass	Female	Conservative	Yes	Lap to open	6	No	Appendicitis	-	-	-
33	Sumathy	27	Mass	Female	Conservative	Yes	Lap	3	No	Appendicitis	-	-	-
34	Latha	28	Abscess	Female	Drainage	Yes	Lap	3	No	Appendicitis	-	-	-
35	Murugan	49	Abscess	Male	Drainage	Yes	Lap	4	No	Appendicitis	-	-	-
36	Muthiah	52	Abscess	Male	Drainage	Yes	Lap	5	No	Appendicitis	-	-	-
37	Anand	41	Mass	Male	Conservative	No	-	-	-	-	Yes	No	No
38	Priya	21	Mass	Female	Conservative	No	-	-	-	-	Yes	No	No
39	Raja	23	Abscess	Male	Drainage	Yes	Lap	3	No	Appendicitis	-	-	-
40	Raghu	47	Abscess	Male	Drainage	Yes	Lap	4	No	Normal	-	-	-
41	Ramya	22	Mass	Female	Conservative	No	-	-	-	-	Yes	No	No
42	Janaki	37	Mass	Female	Conservative	No	-	-	-	-	Yes	No	No
43	Vimala	30	Mass	Female	Conservative	No	-	-	-	-	Yes	No	Yes
44	Bala	23	Abscess	Female	Drainage	Yes	Lap	3	No	Appendicitis	-	-	-
45	Venugopal	56	Mass	Male	Conservative	No	-	-	-	-	Yes	No	No
46	Rajammal	61	Mass	Female	Conservative	No	-	-	-	-	Yes	No	No
47	Swetha	20	Abscess	Female	Drainage	Yes	Lap to open	7	Wound gaping	Appendicitis	-	-	-
48	Shankar	19	Mass	Male	Conservative	No	-	-	-	-	Yes	No	No
49	Sujatha	21	Mass	Female	Drainage	Yes	Lap	3	No	Appendicitis	-	-	-
50	Nasreen	19	Abscess	Female	Drainage	Yes	Lap	4	No	Normal	-	-	-

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